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bibliography to the

CRABS (BRACHYURA) OF THE GULF OF MEXICO

LAWRENCE W. POWERS

contributions in marine science—supplement to vol. 20

A Catalogue and Bibliography
TO THE
CRABS (BRACHYURA) OF THE GULF OF MEXICO

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EDITOR'S NOTE

We are offering, "A Catalogue and Bibliography to the Crabs (Brachyura) of the Gulf of Mexico," By Lawrence W. Powers as a supplement to Volume 20 of our Contributions in Marine Science. We hope that this type of monographic work will stimulate further syntheses.

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INTRODUCTION

The purpose of this catalogue and bibliography is to provide a convenient reference source for information on the brachyuran (true) crabs of the Gulf of Mexico. Although it is intended primarily for zoologists and others familiar with taxonomic resources, the catalogue includes some informal features in order to increase its usefulness to students and persons without systematic experience. The catalogue is a compilation of recent literature and the taxonomic organization of the species entries represents the author's interpretation of revisions by carcinological authorities. As a reference source, it is intended to be a compromise between the systematic works with formal synonymies and descriptions of species and various bibliographies that could be generated by the use of computerized key word entries.

The major part of the catalogue consists of a checklist of species from the Gulf of Mexico (referred throughout the text as the Gulf) that was compiled from the published literature. Unpublished materials, such as theses, manuscripts, and uncirculated reports, were included sparingly. Doctoral dissertations were cited in cases where the material was not published elsewhere or when the topic was considered essential for inclusion in this work. It was not possible to examine and include every known reference and some sources were inadvertently missed; omissions and errors should be brought to the attention of the author. A complete checklist of the Brachyura of the Gulf has not been published since Rathbun's multi-volume work, "The Crabs of America" (1918, 1925, 1930, 1937). Since that time, numerous local and regional surveys have yielded new findings on the distribution and biology of many species, new species have been described, and revisions in the systematic organization of several groups have appeared. For most non-specialists, much of this documentary literature is inaccessible and the taxonomic revisions may be difficult to evaluate. The present work should serve as an introduction to the literature for a species and it should also indicate the amount of data and type of research available for a species or group of crabs.

References to the literature are divided into two sections. Those of value in identification and characterization of a species are listed under the name and source of original description. These citations include synonyms and other invalid names; they occasionally emphasize a name or part of a description that is not synonymous (e.g., Williams, 1974a, p. 731, figs. 4, 18a (not 18b), 20c, etc.). Other references are listed under "Remarks": they provide information on the natural history, ecology, development, physiology, behavior, pathology, or commercial fishery of a species. For some commercially-important species, the available literature is large and widely scattered. The citations for these species are listed with a minimum of descriptive explanation and the number of omitted references will be proportionately higher than for those species with only a few known references.

The species entries consist of the current valid name, the published original reference of the species description, common names (if any), taxonomic and

descriptive references, geographical and bathymetric distributions, habitats, and bibliography with annotations and comments. Species are arranged alphabetically within genera and subgenera, as are genera within subfamilies.

Geographical ranges are based on published sources. If the identification of a species or locality is doubtful, the locality is preceded by a question mark. Place names are listed from north to south and east to west; eastern Atlantic localities follow western Atlantic; eastern Pacific and Indo-Pacific localities are cited last. The presence of a species is not assumed in the absence of collection records from large gaps in otherwise continuous distributions. For example, many species are listed for the Carolinas and the east coast of Florida, without indicating presence in Georgian waters.

Bathymetric ranges are presented in meters and in fathoms, in order to facilitate comparisons with new data as they appear in the literature. Depths are omitted for semiterrestrial and terrestrial crabs.

Habitat descriptions include substrate types, terrain features (land crabs), associations with other organisms (commensals, parasites), type of water (marine, brackish), and general biotope (estuarine, marsh, rocky intertidal, offshore benthic, etc.). Terrestrial habitats are usually described in greater detail than aquatic habitats.

Remarks include literature citations on all aspects of the biology of the species. In many cases, the available literature may consist only of one or a few published descriptions or citations of the species. Regional lists include faunal surveys in the Gulf of Mexico area. These lists may include data on the habitats, seasonal occurrence, and biology of the crabs, or they may list only the species names. Species identifications were usually verified by a specialist; most of the lists were published. Other remarks include discussions of taxonomic revisions, identification problems, comparisons with other related species, records of ovigerous females, and ecological notes.

CLASSIFICATION

A review of attempts to classify decapod crustaceans, including arrangements of brachyuran families, was presented by Glaessner (1969) in *Treatise on Invertebrate Paleontology*. The scheme adopted for the *Treatise*, a compromise of paleontological and zoological considerations, is used in the present catalogue. Table I presents an outline of the extant families of Brachyura as recognized by Glaessner (1969) and modified for the present work.

The family Hapalocarcinidae is not included in Glaessner (1969) and the Palicidae is listed within the Brachyrhyncha as Superfamily Uncertain. Fenner Chace, in a review of a preliminary manuscript of this catalogue, suggested the placement of the hapalocarcinids as a separate section, although Verrill (1908, p. 426) proposed the inclusion of these crabs as "a peculiar superfamily group," apparently among the Oxystomata. Chace also suggested the inclusion of the Palicidae among the Xanthoidea as a matter of convenience. The freshwater family of crabs, Potamidae, has been revised by Bott (1955b) and separated into two families, the Pseudothelphusidae and the Trichodactylidae. The Prosopidae

TABLE I

Classification of Brachyuran Families

INFRAORDER BRACHYURA

SECTION DROMIACEA de Haan, 1833

- Superfamily DROMIOIDEA de Haan, 1833
  - Family PROSOPIDAE von Meyer, 1860
  - Family DYNOMENIDAE Ortmann, 1892
  - Family DROMIIDAE de Haan, 1833
- Superfamily HOMOLOIDEA White, 1847
  - Family HOMOLIDAE White, 1847

SECTION OXYSTOMATA H. Milne Edwards, 1834

- Superfamily DORIPPOIDEA de Haan, 1841
  - Family DORIPPIDAE de Haan, 1841
- Superfamily CALAPPOIDEA de Haan, 1833
  - Family CALAPPIDAE de Haan, 1833
  - Family LEUCOSIIDAE Samouelle, 1819
- Superfamily RANINOIDEA de Haan, 1841
  - Family RANINIDAE de Haan, 1841

SECTION HAPALOCARCINIDEA Calman, 1900

- Superfamily HAPALOCARCINOIDEA Calman, 1900
  - Family HAPALOCARCINIDAE Calman, 1900

SECTION OXYRHYNCHA Latreille, 1803

- Family MAJIDAE Samouelle, 1819
- Family PARTHENOPIDAE Macleay, 1838

SECTION BRACHYRHYNCHA Borradaile, 1907

- Superfamily PORTUNOIDEA Rafinesque, 1815
  - Family PORTUNIDAE Rafinesque, 1815
- Superfamily XANTHOIDEA Dana, 1851
  - Family XANTHIDAE Dana, 1851
  - Family GERYONIDAE Colosi, 1924
  - Family GONEPLACIDAE Macleay, 1838
  - Family POTAMIDAE Ortmann, 1896
  - Family PINNOTHERIDAE de Haan, 1833
  - Family GRAPSIDAE Macleay, 1838
  - Family GECARCINIDAE Macleay, 1838
  - Family PALICIDAE Bouvier, 1898
- Superfamily OCYPODOIDEA Rafinesque, 1815
  - Family OCYPODIDAE Rafinesque, 1815
  - Family RETROPLUMIDAE Gill, 1894

SECTION CANCRIDEA Latreille, 1803

- Superfamily CANCROIDEA Latreille, 1803
  - Family CANCRIDAE Latreille, 1803
  - Family CORYSTIDAE Samouelle, 1819
  - Family ATELECYCLIDAE Ortmann, 1893

includes the subfamily Homolodromiinae Alcock, 1899, usually treated as a family in other systematic classifications. The Latreillidae was recognized as a separate family by Rathbun (1937), whereas Balss (1957) included the genus *Latreillia* Roux in the Homolidae. Glaessner (1969) tentatively adopted the arrangement of Balss, but left the question of placement open; the Latreillidae are presented as a separate family in the present work. The families Dynomenidae and Retroplumidae do not contain species represented in the Gulf of Mexico.

The arrangement of species and genera within their respective higher taxa may differ according to the current stability of nomenclature within the group. Within the Xanthidae, subfamilies are not listed because the arrangement of genera is incomplete, pending further revisions by Guinot and others. The genus *Uca* of the Ocypodidae has received considerable attention from carcinologists, notably Bott (1973) and Crane (1975). Both of these workers have proposed subgenera to accommodate findings of morphological, biogeographical, and behavioral similarities among species groups. Because the changes are too recent to permit evaluation by other specialists, the species of *Uca* are listed in the present text alphabetically; controversial forms, proposed as full species by some workers and as subspecies by others, are treated as species for the present. It is much easier to combine separate sets of references and records than to attempt to separate them at a later date. Generally, this plan has been followed throughout the systematic presentation; when a taxon can be treated in two or more ways, the simplest arrangement was selected.

A discussion of brachyuran evolution is beyond the scope of this catalogue and the reader is referred to papers by Bourne (1922), Gordon (1963), Stevcic (1971a, 1971b) and the monograph, *Treatise on Invertebrate Paleontology*, which includes the review by Glaessner (1969). This latter reference also compares and discusses the various classification schemes that have been proposed to account for presumed affinities of living and fossil specimens.

BIOGEOGRAPHY

The species catalogue recognizes 352 species of 158 genera, belonging to 22 families. Enumerations of taxa are somewhat arbitrary, depending on the amount of splitting or lumping of various groups. In addition to the 352 species recorded from the Gulf of Mexico, two subspecies and two varietal forms are listed as distinct entries, three species of uncertain Gulf distribution are included (recorded from Cuban waters, coast unspecified), and one species from outside of the Gulf is listed because of nomenclatural relationships with a Gulf species. Forty-one of the 352 species are presently regarded as endemic to the Gulf; the distribution of species and genera by family are listed in Table II.

The greatest number of endemic species occurred among the Pinnotheridae, a family composed mainly of crabs commensal with other organisms. Specificity for hosts and other restrictions imposed by the biology of commensal associates may account for the high ratio of endemism in this family. The largest families, in terms of total numbers of species, contain relatively few species confined to the

TABLE II

Endemic and Total Species and Genera of Brachyura

Family	Endemic species	Total Species	Total Genera
Dromiidae	0	5	3
Prosopidae	0	2	2
Homolidae	1	4	3
Latreillidae	0	1	1
Raninidae	1	7	4
Dorippidae	6	16	7
Calappidae	0	13	5
Leucosiidae	0	15	8
Hapalocarcinidae	0	1	1
Majidae	4	77	33
Parthenopidae	0	13	8
Atelecyclidae	0	1	1
Cancridae	0	1	1
Portunidae	2	27	8
Xanthidae	3	69	32
Geryonidae	0	1	1
Goneplacidae	5	19	15
Palicidae	1	9	1
Pinnotheridae	12	31	7
Grapsidae	1	21	12
Gecarcinidae	0	4	2
Ocypodidae	5	15	3
Total	41	352	158

Gulf. The Majidae, Xanthidae, Portunidae, and Grapsidae have endemic percentages of less than 10% of total Gulf species, whereas the Dorippidae, Goneplacidae, and Ocypodidae contain endemic ratios of one-fourth or greater.

The geographical distribution of Gulf species within other areas is compared in Table III. The degree of affinity with the Caribbean fauna is indicated by the large percentage of Gulf crabs also occurring in the Greater Antilles (63.1%), Lesser Antilles (55.7%), and north coast of South America (34.7%). Within these regions, however, there exist considerable differences in collection effort and subsequent taxonomic study. Thus, the number of apparent species recorded from a particular island or section of continental coastline may be a better measure of the number of marine science institutes present than actual species diversity or richness.

Eastern Florida, the Bahamas, and Bermuda contain successively fewer Gulf species, whereas the combined Virginian and Carolinian Provinces of the Atlantic coast contain 44.3% of the total Gulf crabs. The number of Gulf species present in the eastern Atlantic comprises only 7.7% of the Gulf total and one-third of these belong to the ubiquitous Grapsidae. Only 16 Gulf species (4.5%) are also recorded from the eastern Pacific; seven species have been collected from other parts of the Indo-Pacific region.

TABLE III

Distribution of Gulf Crabs in Other Areas

Family	Total species	Caribbean GA	LA	SA	WC	Western Atlantic EF	BA	BE	NC	Other EA	EP
Dromiidae	5	4	3	3	0	2	2	2	4	0	0
Prosopidae	2	2	2	0	0	1	0	0	0	0	0
Homolidae	4	3	2	0	1	1	1	0	2	2	0
Latreillidae	1	1	0	0	0	0	0	0	1	1	0
Raninidae	7	5	1	1	2	1	1	0	3	1	2
Dorippidae	16	12	5	0	0	2	0	0	5	1	1
Calappidae	13	8	8	4	4	5	3	4	10	2	2
Leucosiidae	15	10	10	5	0	5	3	0	9	0	0
Hapalocarcinidae	1	0	1	0	0	0	0	1	0	0	0
Majidae	77	55	53	26	21	28	25	8	37	1	1
Parthenopidae	13	8	8	4	0	5	4	1	9	0	0
Atelecyclidae	1	0	1	0	0	0	0	0	0	0	0
Cancridae	1	0	0	0	0	1	0	1	1	0	0
Portunidae	27	20	17	16	13	16	11	13	16	6	1
Xanthidae	69	46	49	34	20	20	31	15	27	4	2
Geryonidae	1	1	0	0	0	1	0	0	1	0	0
Goneplacidae	19	8	5	1	0	2	2	2	5	0	0
Palicidae	9	2	4	2	0	3	1	0	4	0	0
Pinnotheridae	31	10	3	2	1	5	0	0	13	0	0
Grapsidae	21	15	13	13	8	6	11	9	6	9	6
Gecarcinidae	4	4	4	4	4	3	3	2	0	0	1
Ocypodidae	15	8	7	7	6	8	6	1	3	0	0
Total	352	222	196	122	80	115	104	59	156	27	16

GA = Greater Antilles; LA = Lesser Antilles; SA = north coast of South America; WC = western Caribbean, including east coast of Central America; EF = east coast of Florida; BA = Bahamas; BE = Bermuda; NC = U.S. Atlantic coast, from New England to Georgia; EA = eastern Atlantic, from Europe to South Africa and mid-South Atlantic islands; EP = eastern Pacific, from California to Chile, including Galapagos.

The distribution of species within the Gulf of Mexico is presented in Table IV, with the Gulf regions diagrammed in Figure 1. Again, some areas have been sampled often (e.g., west and northwest coasts of Florida) and other areas have received only sporadic attention (east coast of Mexico). More species occur on the limestone-based continental shelf of the eastern Gulf than on the sand and mud substrates of the western Gulf. The Gulf regions in Figure 1 correspond to the geophysical features described by Antoine (1972) as Gulf provinces. The dominant sediment types are shown in Figure 2 and reef patches are indicated in Figure 3. Most Gulf species are probably West Indian in origin or affinity (see discussion below), where the shallow water habitats are similar to Gulf regions 1, 2, and 6. The north coast of Cuba (region 7) also contains a relatively high species abundance, probably associated with the greater degree of habitat diversity and wide depth range in that part of the Gulf. A detailed analysis of species distribution patterns, by families, will not be attempted in the present contribution. Table IV summarizes the species recorded to date from each of

TABLE IV

Species Distribution Within the Gulf of Mexico

Family	Total species	Gulf Region (Figure 1) 1	2	3	4	5	6	7
Dromiidae	5	5	2	3	0	0	2	2
Prosopidae	2	1	0	0	0	0	0	2
Homolidae	4	2	0	0	1	0	0	3
Latreillidae	1	1	0	0	0	0	0	1
Raninidae	7	5	1	2	2	2	0	4
Dorippidae	16	8	2	2	1	1	1	11
Calappidae	13	11	5	5	3	3	4	5
Leucosiidae	15	13	8	3	1	1	1	3
Hapalocarcinidae	1	1	0	0	0	0	0	0
Majidae	77	61	38	20	7	1	15	31
Parthenopidae	13	10	6	4	0	0	3	4
Atelecyclidae	1	0	1	1	1	1	0	0
Cancridae	1	1	0	0	0	0	0	0
Portunidae	27	23	11	13	6	6	11	16
Xanthidae	69	61	28	26	4	0	7	35
Geryonidae	1	1	1	1	1	0	0	1
Goneplacidae	19	12	5	8	2	0	8	8
Palicidae	9	5	5	2	1	0	3	4
Pinnotheridae	31	16	12	10	1	0	2	6
Grapsidae	21	16	3	8	6	1	3	11
Gecarcinidae	4	2	0	2	3	3	3	3
Ocypodidae	15	6	7	8	7	3	6	7
Total	352	261	145	118	47	22	69	161

these regions. An analysis of breeding times and collection sites of ovigerous females, combined with data on circulation patterns of currents, larval maturation periods, and tolerances to environmental parameters (temperature, salinity, oxygen content, etc.), will be necessary to establish a comprehensive biogeography of Gulf crabs.

DISCUSSION

The distribution of decapod crustaceans in the western Atlantic has been the subject of several discussions in recent years. Hedgpeth (1953) summarized much of what was known about the geology and zoogeography of the Gulf of Mexico. He emphasized the role of Pleistocene sea level changes and their effects on continuous distributions of marine organisms in the Carolinian Province, a region encompassing shores and adjacent waters from Texas to Cape Hatteras. After the Florida peninsula emerged, isolation of the Gulf and Atlantic populations occurred for many species not able to circumvent the tropical waters of South Florida. The distributions of *Ovalipes* and *Uca* were cited by Abele (1970) as examples. For this reason the range citations in the present contribution attempt to distinguish eastern, southern, and western Florida records.

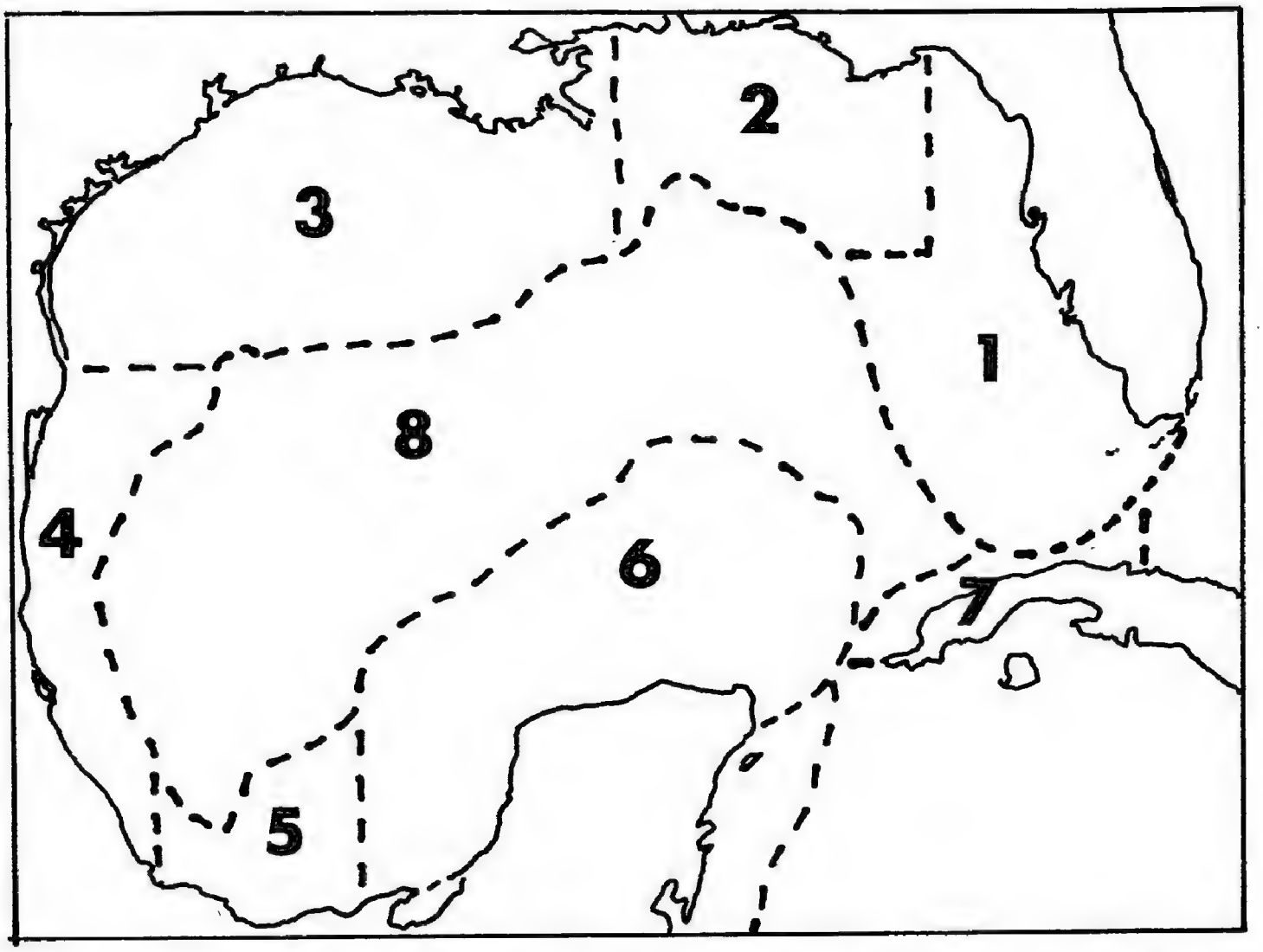


FIG. 1. Regions of the Gulf of Mexico, based on geological assemblages, depth, and geophysical characteristics. After Antoine (1972); numbers refer to Table IV and do not correspond with province numbers used by Antoine in his Figure 1–1.

Williams (1965) computed an Atlantic-Gulf disjunct ratio of about 10%, based on studies of Carolina decapods. Only 3 (1.4%) of the species presented in his Table 1 were considered endemic to the Carolinas, further evidence of the ubiquitous nature of the northern fauna. Abele (1970) emphasized the northern and southern affinities of the northeastern Gulf decapods, which he believed was better characterized as a heterogenous assemblage rather than a typical fauna of a province he considered to be ill-defined. In his analysis, 91 species (36.5%) of decapods were similar to the typical Carolinian fauna, but many species previously thought to have a disjunct distribution have been more recently reported from southern Florida (Tabb and Manning, 1961; Rouse, 1970). Abele listed 33 species (13.4% of the northeast decapod total) as endemic and 41 species (16.4%) as tropical in origin, confined to the Caribbean and Gulf by higher temperature requirements. The remaining 84 species in his study were the ubiquitous fauna that ranged from the Carolinas to the tropics.

Studies of terrestrial and freshwater crabs can provide further insights into possible sources of origin. Chace and Hobbs (1969) listed 57 species of crabs from the Caribbean area, none of which had apparent origins in North America alone (exclusive of Mexico). They concluded that the majority of endemics in the

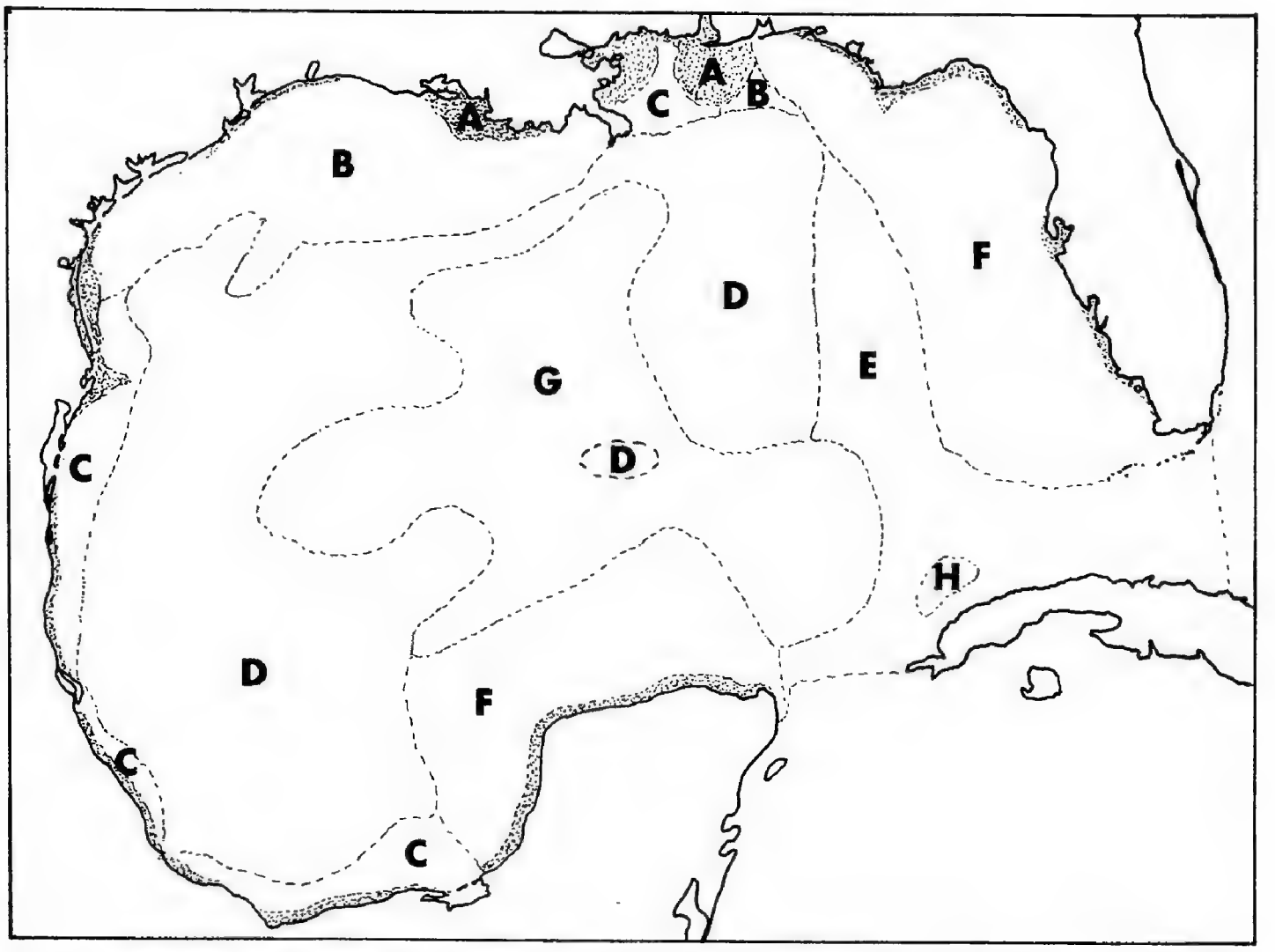


FIG. 2. Areas of the Gulf of Mexico based on dominant sediment type. After Lynch (1954). Coral reefs and patches are shown in Figure 3.

A = sand, includes other narrow stippled areas adjacent to continental coastline.
B = sand-mud.
C = mud.
D = blue mud.
E = calcareous mud.
F = limestone with thin veneer of detrital sediments.
G = *Globigerina* ooze.
H = pteropod ooze.

Greater Antilles had originated in Central America or southern Mexico and a few had arrived from South America. The directions of prevalent surface currents (Figure 4) indicate the one-way flow of potential larval populations out of the Caribbean into the Gulf. Although the patterns of loop currents within the Gulf change seasonally, successive recruitment of Caribbean fauna to various parts of the Gulf are possible throughout the year. Various sources (Williams, 1965 summarizes many of the records) indicate that many Caribbean crab species are ovigerous throughout the year; thus Gulf recruitment to a particular shore segment would be a function of current pattern and speed, seasonal temperature, and length of larval life. Laboratory studies of larval development (summarized by Garth, 1965b) indicate that warmer temperatures prolong maturation time. Larval populations thus carried into the Gulf could be diverted into one of several directions. The westward entering currents sweep the shores

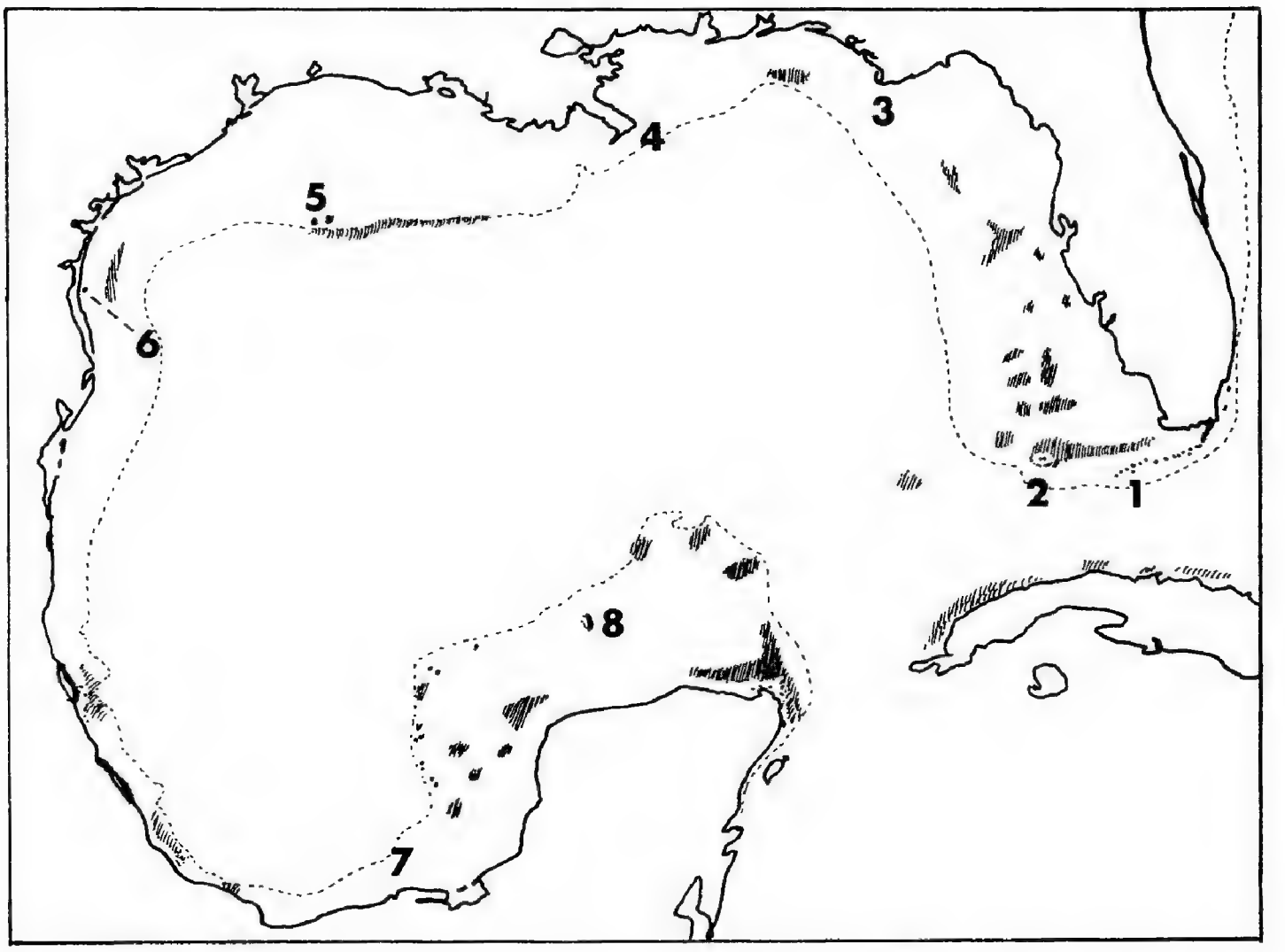
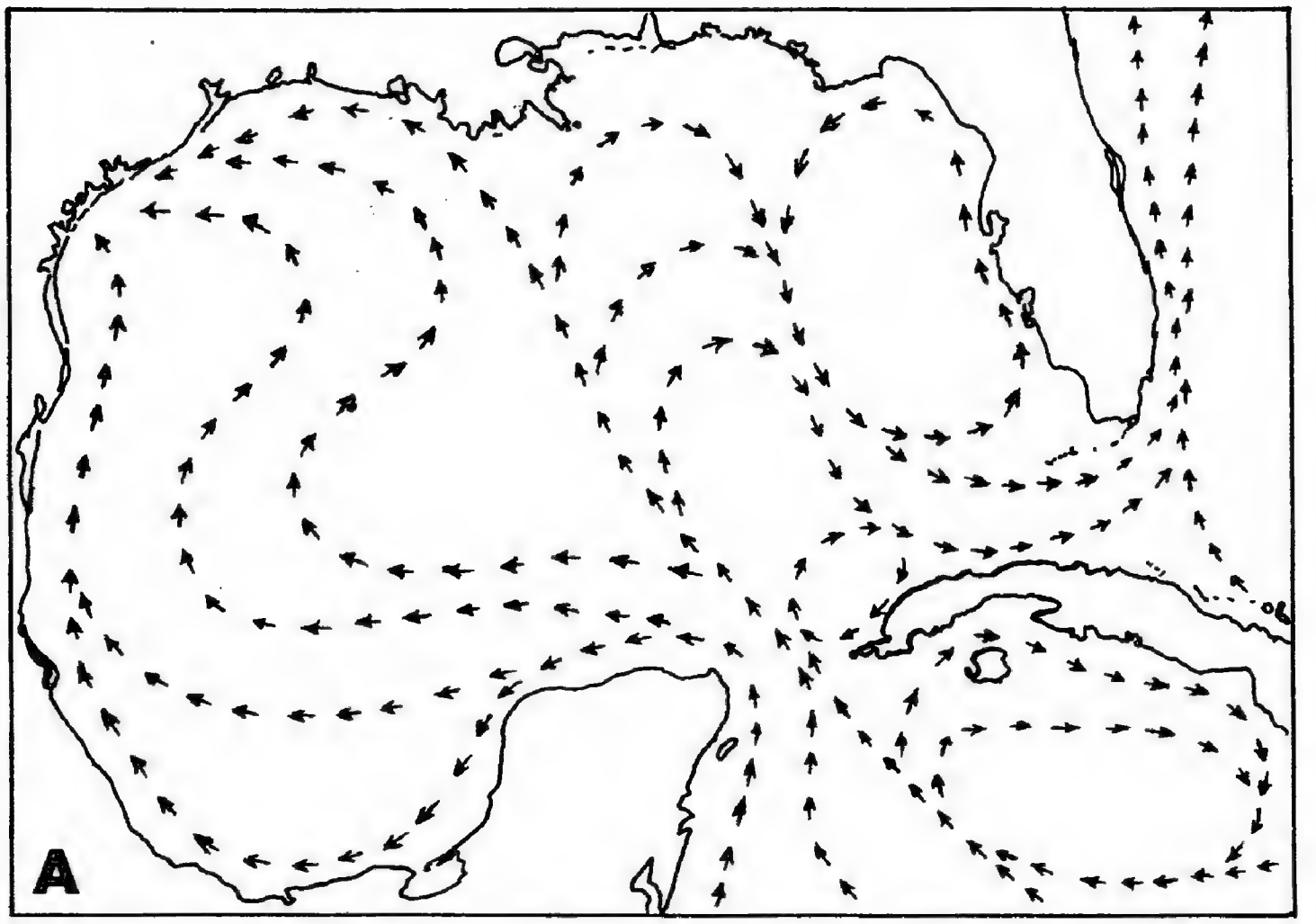


FIG. 3. Location of major coral reefs and other features of the Gulf of Mexico, derived from several sources, including Lynch (1954). Dashed line represents the 100 fathom (600 feet) isobath.

1—Florida Keys
2—Dry Tortugas
3—Apalachicola Bay and Cape San Blas
4—Mississippi River Delta
5—East and West Flower Garden Banks, off Texas
6—Seven and One-Half Fathom Reef, off Padre Island
7—Pink Shrimp Grounds in Campeche Bay
8—Alacrán Reef on Campeche Bank

of Yucatan, eastern Mexico, and eventually, converge with other currents off Texas. Central entering currents flow northwest, into region 3 (Figure 1). The most complex patterns occur as the eastward currents diverge and converge in seasonal patterns of loops. Much of the resultant flow sweeps through the Straits of Florida to emerge into the Atlantic as the warm, northward moving Gulf Stream. Other loops circulate up the west coast of Florida, reaching as far as the Mississippi delta in the winter (Figure 4B). Although these large scale current diagrams do not indicate the complexity of water movements in the Gulf region, nor do they allow one to evaluate the spatial and temporal variations in local currents that might be used for the migration of larval crabs, Figure 4 (after Leipper, 1954) does indicate the successive relationship between Caribbean, Gulf, and western Atlantic faunal provinces, respectively. Undoubtably, many western



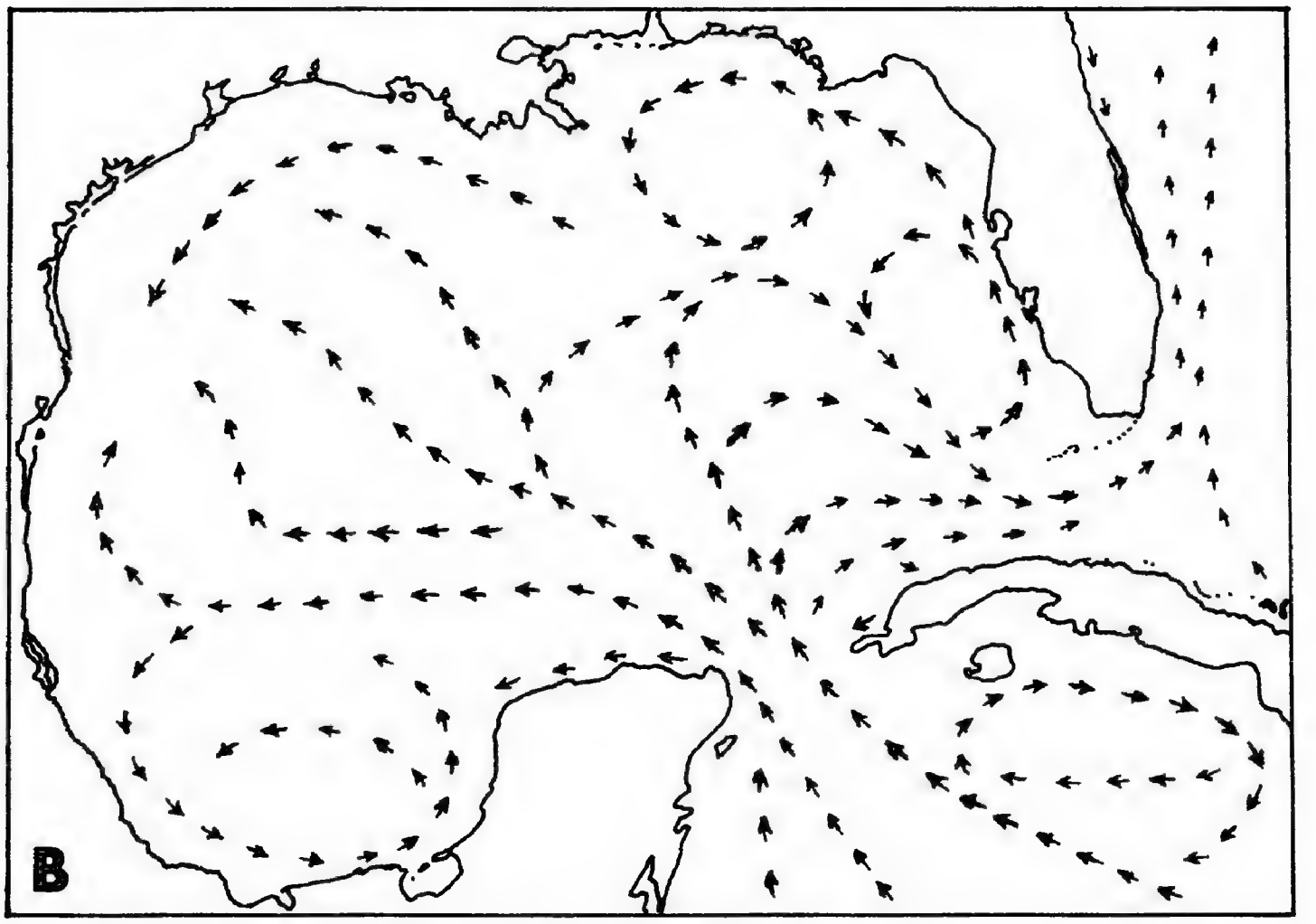


FIG. 4. Surface currents of the Gulf of Mexico (after Leipper, 1954).
4A. Current patterns in June.
4B. Current patterns in December.

Atlantic faunal affinities with West Indian elements occur as a result of direct recruitment, bypassing the Gulf of Mexico.

Specific genera that have been recently investigated and summarized with respect to zoogeography include *Sesarma* (Abele, 1973), *Ovalipes* (Williams, 1976), *Callinectes* (Williams, 1974a), and *Uca* (Crane, 1975). Abele (1973) divided the six Florida species of *Sesarma* into those with Carolinian and West Indian affinities. Although Hedgpeth (1953) had emphasized salinity and temperature tolerances as reasons for the absence of *Sesarma cinereum* and *S. reticulatum* from southern Florida, Abele (1973) believes that competitive exclusion by *S. ricordi* may account for the absence of the first and possibly the second disjunct species. Interspecific competition is an unknown factor in the distribution of virtually every brachyuran species, especially the aquatic crabs. An exception is the genus *Uca*, where intensive studies by several authorities over the past half century have produced the largest amount of biological data on any one crab genus. Crane (1975) summarized the zoogeographical and evolutionary information on *Uca* distribution. She remarked on the relatively depauperate Atlantic fauna of this genus, compared to the rich and diverse Pacific assemblage, also known for many other groups of invertebrates. The differences are attributed to cooling during the Oligocene to Pleistocene, which was far more severe in the Atlantic than in the Pacific, resulting in the extinction of many sensitive tropical species. The isolation of the Caribbean at the end of the Pliocene, due to the emergence of Panama, resulted in the Atlantic assemblage, each species of which has a Pacific analogue. Only *U. subcylindrica*, a poorly-known Gulf endemic, has no eastern Pacific counterpart. Other Gulf species of *Uca*, five of which are endemic, may be in the process of rapid speciation. The most recently-described species, *Uca panacea* (Novak and Salmon, 1974), may have diverged from *U. pugilator* behaviorally and ecologically with only minimal morphological change. Many authorities are reluctant to consider this form a separate species without further evidence of isolation or distinction. The same applies to *U. virens* and *U. longisignalis* (see entries in systematic section), two forms similar to *U. pugnax* of the Atlantic coast. An analysis of courtship displays and habitat requirements reveals the divergence of the species not detected from preserved specimens alone. This evidence is substantiated by preliminary comparisons of isozyme patterns for Atlantic and Gulf populations of *U. panacea*, *U. pugilator*, *U. pugnax*, *U. virens*, and *U. longisignalis* (Selander, Johnson and Avise, 1971; Selander, pers. comm.). Unfortunately, this glimpse of speciation in progress is a rare exception to the usual type of information available. Most accounts of zoogeography depend on collection records derived from preserved specimens. Misidentifications, erroneous locality labels, and gaps in collection efforts are familiar difficulties.

This contribution is offered as a preliminary step toward compiling the necessary information for a synthesis on the distribution and evolution of crabs in the Gulf region. It should facilitate the collection of data on particular groups of crabs and the comparison of specific lines of evidence relative to ecological, behavioral, physiological, or developmental aspects. It can also indicate the rela-

tive lack of information on the majority of species that have been collected and formally described, but in which observations on living animals are minimal or lacking. Hopefully, it will serve to stimulate increased efforts at erasing these defficiencies in our knowledge of some of the most fascinating animals man can hope to meet.

SPECIES ENTRIES

Infraorder BRACHYURA Latreille, 1803

SECTION DROMIACEA de Haan, 1833

Superfamily DROMIOIDEA de Haan, 1833

Family DROMIIDAE de Haan, 1833

Dromia Weber, 1795

Dromia erythropus (George Edwards, 1771) (Cat. Anim. Catesby's Nat. Hist. Carolinas, with Linnaean Names)

Rathbun, 1933, p. 107, fig. 105; Rathbun, 1937, p. 31, text-fig. 11, pl. 6, figs. 1, 2, pl. 8, figs. 1, 2; Felder, 1973a, p. 44, pl. 6, fig. 2.

Range: Bermuda; Bahamas; Florida Keys and Dry Tortugas; off Louisiana and Texas; north coast of Cuba; Jamaica; Haiti; Puerto Rico; St. Thomas to Barbados; Netherlands Antilles; Pernambuco to São Paulo, Brazil.

Depth: shallow water to 360 m (to 197 fm), most common at depths of less than 46 m (25 fm).

Habitat: on hard substrates (coral, shell, near rocks); dorsal carapace is always covered with sponges or compound ascidians.

Remarks: Felder (1973) lists collection localities of Seven and One-Half Fathom Reef off Texas and a sublittoral prominence about 90 miles south of Pecan Island, in the South Atlantic, but a recent (1977) personal communication from Dr. Chace indicates that the St. Helena specimens are still not positively identified; however, they are not *D. erythropus*. Coelho and Ramos (1972) list this species from Brazil. Hazlett (1971) has examined the antennule chemosensitivity of this species.

Dromidia Stimpson, 1858

Dromidia antillensis Stimpson, 1858 (Ann. Lyc. Nat. Hist. New York 7: 71)

Hay & Shore, 1918, p. 417, pl. 31, fig. 5; Rathbun, 1933, p. 108, fig. 106; Rathbun, 1937, p. 33, text-fig. 12, pl. 7, figs. 1–3; Chace, 1940, p. 6; Williams, 1965, p. 143, fig. 118; Felder, 1973a, p. 44, pl. 6, figs. 1, 3.

Range: Bermuda; North Carolina; Bahamas; southeast Florida; Florida Keys, Straits, and Dry Tortugas; west coast of Florida to Texas; northwest and north coasts of Yucatan; off west and south coasts of Cuba; Jamaica; Haiti; Puerto Rico; Virgin Islands; Grenada; off Bahia to Espirito Santo, Brazil.

Depth: shore to 331 m (to 170 fm).

Habitat: from hard bottoms (shell, rock, or coral); usually carries a sponge or compound ascidian over the dorsal carapace. Uncommon to rare in many Gulf areas, but Hildebrand (1955) reported this crab as common on the pink shrimp grounds of Campeche, Mexico, in 6 to 16 fm (11 to 29 m) of water.

Remarks: Rathbun (1937) reported ovigerous females in winter, spring, and summer from Florida and the West Indies, and she also listed specimens with infestations of bopyrid parasites. Williams (1965) noted crabs that carried zoanthoid polyps; specimens from Alligator Harbor in northwest Florida carried the ascidian, *Eudistoma capsulatum* (Wass, 1955). Regional lists include Florida (Dragovich and Kelly, 1964; Abele, 1970; Menzel, 1971), Mississippi (Franks *et al.*, 1972), Texas (Hildebrand, 1955; Parker, 1959; Leary, 1967), and Mexico (Hildebrand, 1955). Felder (1973a) indicates that this species is common on Seven and One-Half Fathom Reef, off Texas; Chace (1956) listed this species from several Gulf stations of the R/V *Oregon*. Listed from French Guiana by Guinot-Dumortier (1959) and from Brazil by Coelho and Ramos (1972). Larval development under laboratory conditions was studied by Rice & Provenzano (1966).

Hypoconcha Guerin, 1854

Hypoconcha arcuata Stimpson, 1858 (Proc. Acad. Nat. Sci. Philadelphia 1858: 226)

Hay & Shore, 1918, p. 418, pl. 31, fig. 3 (not 2); Rathbun, 1937, p. 47, pl. 11, figs. 1–4; Williams, 1965, p. 144, fig. 119.

Range: North Carolina to southern Florida; Dry Tortugas; west coast of Florida; St. Thomas, Virgin Islands; Surinam to Espirito Santo, Brazil.

Depth: 2 to 40 m (1 to 22 fm).

Habitat: sand and shell substrates. Williams (1965) notes that this species is always found with a lamellibranch mollusc shell, usually a clam, which it carries over its back by its claws and fourth and fifth walking legs.

Remarks: Listed from Florida by Wass (1955), Dragovich and Kelly (1964), Abele (1970), and Menzel (1971). Kircher (1970) studied larval development under laboratory conditions.

Hypoconcha sabulosa (Herbst, 1799) (Vers. Natur. Krabben u. Krebse, vol. 3, p. 57)

Hay & Shore, 1918, p. 418, pl. 31, fig. 2 (not 3); Rathbun, 1937, p. 44, pl. 8, figs. 3–4, pl. 9, figs. 1–5; Williams, 1965, p. 145, fig. 120; Felder, 1973a, p. 44, pl. 6. fig. 5.

Range: off North Carolina; Florida Keys and Dry Tortugas; off Texas; Jamaica; Guianas; Moranhão to Bahia, Brazil.

Depth: 1 to 90 m (to 49 fm).

Habitat: from sand, shell, and coral bottoms; Williams (1965) states that the habits of this crab are similar to those of *H. arcuata*, but that it is a much rarer species.

Remarks: Listed from Florida by Hulings (1961) and Abele (1970) and from Brazil by Coelho and Ramos (1972).

Hypoconcha spinosissima Rathbun, 1933 (Proc. Biol. Soc. Washington 46: 185)

Rathbun, 1937, p. 46, text-fig. 14, pl. 10, figs. 1–2; Felder, 1973a, p. 44, pl. 6. fig. 4.

Range: off North Carolina; Dry Tortugas; west coast of Florida; ? Texas; off north coast of Yucatan; Jamaica.

Depth: 26 to 110 m (14 to 60 fm).

Habitat: broken coral or shell, sand bottoms.

Remarks: Although listed by Leary (1967) for Texas, I know of no published collection records to verify its presence in the northwestern Gulf. Felder (1973a) includes this species, based on the listing by Leary.

Family PROSOPIDAE von Meyer, 1860

Subfamily HOMOLODROMIINAE Alcock, 1899

(Glaessner, 1969, corrected the family name Prosoponidae of von Meyer, 1860 and listed three subfamilies: Prosopinae, Pithonotinae, and Homolodromiinae. Only the latter subfamily is extant and many authors treat this group as a family.)

Dicranodromia A. Milne Edwards, 1880

Dicranodromia ovata A. Milne Edwards, 1880 (Bull. Mus. Comp. Zool. 8: 32)

Rathbun, 1937, p. 60, text-fig. 15, pl. 13, figs. 3–4; Chace, 1940, p. 7; Pequegnat, 1970, p. 173.

Range: east and west coasts of Florida; Florida Keys and Straits; off north coast of Cuba; northwest Caribbean Sea; Guadeloupe; Barbados.

Depth: 128 to 895 m (70 to 490 fm).

Habitat: no data available.

Remarks: Rathbun (1937) reported ovigerous females from Florida in June and Chace (1940) reported ovigerous females from Cuba in early May.

Homolodromia A. Milne Edwards, 1880

Homolodromia paradoxa A. Milne Edwards, 1880 (Bull. Mus. Comp. Zool. 8: 33)

Rathbun, 1937, p. 58, pl. 13, figs. 1–2, pl. 14, figs. 1–4; Chace, 1940, p. 7.

Range: north coast of Cuba; off Nevis, Leeward Islands

Depth: 651 to 896 m (356 to 490 fm), possibly to 1106 m (605 fm).

Habitat: no data available.

Superfamily HOMOLOIDEA White, 1848

Family HOMOLIDAE White, 1847

Homola Leach, 1815

Homola barbata (Fabricius, 1793) (Entomol. system., vol. 2, p. 460)

As ***Thelxiope barbata***—Rathbun, 1937, p. 63, text-fig. 16, pl. 15, figs. 1–2; Chace, 1940, p. 8; Barnard, 1950; p. 338, fig. 65d–e.
As ***Homola barbata***—Williams, 1965, p. 146, fig. 121.

Range: Massachusetts to southern Florida; Florida Keys and Dry Tortugas; north coast of Cuba; off east coast of Yucatan (Caribbean); in eastern Atlantic, off Naples, Portugal, Azores, Madeira Islands; off South Africa.

Depth: 55 to 682 m (30 to 373 fm).

Habitat: sand, shell, and coral substrates; occasionally on mud bottoms.

Remarks: The genus names *Thelxiope* and *Homola* have been interchanged by various authors up to 1958, when the latter name was adopted for genus, family, and superfamily designation. Gordon (1950) described reproductive structures and the evolution of this genus among the Dromiacea. Rice (1964) and Rice and Provenzano (1970) studied larval development. Ovigerous females occur in June–July off North Carolina and Florida (Williams, 1965) and in October off Delaware (Rathbun, 1937). Hartnoll (1970, 1971) noted swimming behavior.

Homola vigil A. Milne Edwards, 1880 (Bull. Mus. Comp. Zool. 8: 33)

As ***Thelxiope vigil***—Rathbun, 1937, p. 66, pl. 16, figs. 1–3; Chace, 1940, p. 9.

Range: off Georgia; north and south coasts of Cuba; Guadeloupe; Martinique.

Depth: 309 to 804 m (169 to 440 fm).

Habitat: sand, broken shell, and coral bottoms.

Remarks: Chace (1940) reported ovigerous females from Cuba in April and May.

Homologenus A. Milne Edwards, 1888

Homologenus rostratus (A. Milne Edwards, 1880) (Bull. Mus. Comp. Zool. 8: 34)

Rathbun, 1937, p. 70, text-fig. 17, pl. 17, figs. 1–3; Chace, 1940, p. 9; Pequegnat, 1970, p. 174, fig. 6–1.

Range: Bahamas; east coast of Mexico in southwest Gulf of Mexico; north and south coasts of Cuba; Virgin Islands; near Aves Island (Lesser Antilles); Azores; off Morocco.

Depth: 600 to 1600 m (330 to 875 fm).

Habitat: fine sand, mud, and ooze substrates.

Remarks: Ovigerous females were reported from Cuba in March and May (Chace, 1940) and from the Windward Passage in April (Rathbun, 1937).

Hypsophrys Wood-Mason, 1891

Hypsophrys noar Williams, 1974 (Proc. Biol. Soc. Washington 87: 485)

Williams, 1974b, p. 485, figs. 1–12.

Range: southwest of Dry Tortugas, in Florida Straits.

Depth: 732 m (400 fm).

Remarks: Williams (1974b) compares this species, known only from the type specimen, with the other two species of *Hypsophrys*. The male holotype carried a number of small barnacles, *Poecilasma inaequilaterale*, on the abdominal setae and left cheliped.

Family LATREILLIIDAE Alcock, 1899

(This family, including the genera *Latreillia* Roux and *Latreillopsis* Henderson, was recognized by Rathbun (1937), but these genera were included in the Homolidae by Balss (1957). Glaessner (1969) leaves the position of these genera undetermined.)

Latreillia Roux, 1830

Latreillia elegans P. Roux, 1830 (Crust. Méditerranée et de son littoral, pl. 22, 1828 (1830))

Hay & Shore, 1918, p. 419, pl. 31, fig. 4; Rathbun, 1937, p. 73, text-fig. 18, pl. 20, pl. 21, figs. 1–8; Chace, 1940, p. 10; Williams, McCloskey & Gray, 1968, p. 42, fig. 1.

Range: Massachusetts to North Carolina; off South Florida; Florida Keys; north coast of Cuba; eastern North Atlantic Ocean; Mediterranean Sea; off Natal, South Africa.

Depth: 46 to 366 m (25 to 200 fm).

Habitat: sand, shell, and coral bottoms; from soft mud; off sponges.

Remarks: Rathbun (1937) reported ovigerous females from Massachusetts in August and from Florida in February.

SECTION OXYSTOMATA H. Milne Edwards, 1834

Superfamily RANINOIDEA de Haan, 1841

Family RANINIDAE de Haan, 1841

(This family is treated as a "subtribe" Gymnopleura of the "tribe" Brachyura by Bourne (1922). Balss (1957) and Glaessner (1969) include this group as family and superfamily within the Oxystomata. The systematic position of the raninids depends, in part, on the relative degree of specialization and primitiveness assgned to the morphological characters of these aberrant crabs.)

Lyreidus de Haan, 1841

Lyreidus bairdii Smith, 1881 (Proc. U.S. Nat. Mus. 3: 420)

Rathbun, 1937, p. 23, pl. 5, figs. 5–6; Chace, 1940, p. 6; Pequegnat, 1970, p. 180.

Range: Massachusetts; Dry Tortugas; west coast of Florida; off Louisiana, Texas, and Mexico; north coast of Cuba; north of Puerto Rico.

Depth: 119 to 823 m (65 to 450 fm).

Habitat: soft mud substrates.

Remarks: Chace (1940) reported a specimen with rhizocephalan parasites from off the north coast of Cuba. Listed from several stations of the R/V *Oregon* by Chace (1956) in the Gulf of Mexico. Pequegnat (1970) considered this species to be the most common raninid in the Gulf and he provides some data on densities at different depths along the continental slope.

Ranilia H. Milne Edwards, 1837

Ranilia constricta (A. Milne Edwards, 1880) (Bull. Mus. Comp. Zool. 8: 35)

Rathbun, 1937, p. 20, pl. 4, fig. 5, pl. 5, figs. 1, 2; Gomes Corrêa, 1970, p. 2; Pequegnat, 1970, p. 180.

Range: Florida Straits; off north coast of Cuba and southeast Gulf of Mexico; Rio de Janeiro, Brazil; eastern Atlantic, Ascension Island; Senegal to Congo.

Depth: off shallow reef (Rathbun, 1937); 183 to 336 m (100 to 200 fm) in Gulf of Mexico (Pequegnat, 1970); original type is from 86 m (47 fm), off Florida.

Habitat: coral reefs; hard bottoms in deep water.

Remarks: Listed from Brazil by Coelho and Ramos (1972). Hartnoll (1971) cites an observation by Darwin on a species of *Ranilia* in the southern Atlantic in which swimming was noted, but the extent to which raninids are able to swim is not known.

Ranilia muricata H. Milne Edwards, 1837 (Hist. nat. Crust., vol. 2, p. 196)

Hay & Shore, 1918, p. 420, pl. 31, fig. 1; Rathbun, 1937, p. 18, pl. 3, figs. 3–6, pl. 4, figs. 1–4; Williams, 1965, p. 142, fig. 117.

Range: North Carolina; Bahamas; Florida Straits; southern to northwestern Florida; Swan Island (Caribbean).

Depth: 9 to 102 m (5 to 56 fm).

Habitat: offshore, on sandy and broken shell substrates.

Remarks: Listed from Florida by Wass (1955), Abele (1970) and Menzel (1971). Rathbun (1937) listed ovigerous females from North Carolina in September. This species has been recovered from fish stomachs in North Carolina offshore waters (Williams, 1965).

Raninoides H. Milne Edwards, 1837

Raninoides lamarcki A. Milne Edwards & Bouvier, 1923 (Mem. Mus. Comp. Zool. 47: 299)

Rathbun, 1937, p. 13, text-fig. 8, pl. 1, figs. 3, 4; Chace, 1940, p. 5.

Range: north of Cuba; north of Puerto Rico; off Colon, Panama (Caribbean).

Depth: 46 to 366 m (25 to 200 fm).

Habitat: no data available.

Remarks: Chace (1940) notes an error in plate 2 of Rathbun, 1937: figure 3 is a chela of *R. lamarcki* and not *R. fossor*, as the label indicates. The error was due to a label interchange on figures a and b of Milne Edwards and Bouvier's (1923) original drawing. Manning (1975) has subsequently indicated that *R.*

fossor is a synonym of an Indo-West Pacific species, *Notosceles chimmonis* Bourne.

Raninoides loevis (Latreille, 1825) (Encycl. méth., Hist. nat., vol. 10, p. 268)

Rathbun, 1937, p. 8, text-fig 3, pl. 1, figs 1, 2; Guinot-Dumortier, 1959, p. 246 fig. 2a–c; Gomes Corrêa, 1970, p. 9.

Range: Florida Keys and Dry Tortugas; southwest coast of Florida; Campeche Bay, off Tabasco, Mexico; Barbados; Colombia (Caribbean); Guianas to Bahia, Brazil; Pacific coasts of Panama and Colombia.

Depth: 18 to 196 m (10 to 107 fm).

Habitat: bottom types include ooze, mud, shelly mud, coral, and broken shell.

Remarks: Listed from the R/V *Oregon* collections in the Gulf of Mexico by Chace (1956). Guinot-Dumortier (1959) and Knight (1968) compared this species with *R. benedicti* Rathbun. Listed from Brazil by Coelho and Ramos (1972).

Raninoides louisianensis Rathbun, 1933 (Proc. Biol. Soc. Washington 46: 186)

Common Name: Frog Crab

Rathbun, 1937, p. 12, text-figs. 6, 7, pl. 1, figs. 5, 6; Pequegnat, 1970, p. 181; Felder, 1973a, p. 38, pl. 4, fig. 6.

Range: Gulf of Mexico, from the Mississippi Delta to Campeche Banks.

Depth: 55 to 400 m (30 to 220 fm). Collection records of the R/V *Alaminos* showed an extension of this species on the middle and outer continental shelf to only 115 fm and Pequegnat (1970) believes that the R/V *Oregon* records at 200 and 220 fm may be due to trawl contamination from earlier, shallower stations.

Habitat: muddy and fine sand-mud bottoms.

Remarks: Listed from Texas by Leary (1967) and from the Gulf of Mexico by Chace (1956). Ovigerous females were taken in February, June, July, and October by the R/V *Alaminos* (Pequegnat, 1970). Franks *et al.* (1972) reported salinity and temperature ranges of collections off Mississippi.

Symethis Weber, 1795

Symethis variolosa (Fabricius, 1793) (Entomol. System. emend. et aucta, vol. 2, p. 476)

Rathbun, 1937, p. 26, text-fig. 10, pl. 5, figs. 7, 8; Gomes Corrêa, 1970, p. 10.

Range: North Carolina; southeast Florida; Florida Keys and Dry Tortugas; north of Puerto Rico; Fernando do Noronha to Bahia, Brazil; Pacific coast of Panama.

Depth: 18 to 110 m (10 to 60 fm).

Habitat: sand, mud bottoms; on calcareous algae; under stones.

Remarks: Cerame-Vivas and Gray (1966) extended the previously known range of this species to North Carolina. Listed from Brazil by Coelho and Ramos (1972) and by Fausto Filho (1974).

Superfamily DORIPPOIDEA de Haan, 1841

Family DORIPPIDAE de Hann, 1841

Clythrocerus A. Milne Edwards & Bouvier, 1899

Clythrocerus nitidus (A. Milne Edwards, 1880) (Bull. Mus. Comp. Zool. 8: 24)

Rathbun, 1937, p. 109, text-figs. 26, 27, pl. 33, figs. 1–2.

Range: South Carolina; southeast and northwest Florida; Florida Keys; Grenada.

Depth: 12 to 479 m (6.5 to 262 fm).

Habitat: rock, coral, sand, shell, and gravel bottoms.

Remarks: Listed by Wass (1955) at 25 fm off Cape San Blas, Florida. Rathbun (1937) reported ovigerous females from Florida in February, March, and late June.

Clythrocerus stimpsoni Rathbun, 1937 (Bull. U.S. Nat. Mus. 166: 121)

Rathbun, 1937, pl. 121, text-fig. 32, pl. 34, figs. 5, 6.

Range: west coast of Florida.

Depth: 183 m (100 fm).

Remarks: Known only from the single female type specimen.

Corycodus A. Milne Edwards, 1880

Corycodus bullatus A. Milne Edwards, 1880 (Bull. Mus. Comp. Zool. 8: 23)

Rathbun, 1937, p. 103, pl. 29, figs. 1–4, pl. 30, fig. 1, pl. 31, fig. 1.

Range: off north coast of Cuba.

Depth: 320 to 457 m (175 to 250 fm).

Cyclodorippe A. Milne Edwards, 1880

Cyclodorippe antennaria A. Milne Edwards, 1880 (Bull. Mus. Comp. Zool. 8: 25)

Rathbun, 1937, p. 104, text-fig. 24, pl. 32, figs. 1, 2; Pequegnat, 1970, p. 177.

Range: west coast of Cuba; north coast of Yucatan (Gulf); north coast of Cuba; Puerto Rico; Lesser Antilles, from Dominica to Grenada.

Depth: 91 to 653 m (50 to 357 fm).

Habitat: primarily hard bottoms (coral, sand, and shell).

Cyclodorippe bouvieri Rathbun, 1934 (Smithsonian Misc. Coll. 91: 1)

Rathbun, 1937, p. 106, pl. 32, figs. 3–4, pl. 81, figs. 1–2.

Range: north coast of Cuba; northeast of Puerto Rico.

Depth: 274 to 549 m (150 to 300 fm).

Remarks: Rathbun (1937) lists an ovigerous female from Puerto Rico, taken in March at 150 fm.

Cyclodorippe ornata Chace, 1940 (Torreia 3: 19)

Chace, 1940, p. 19, figs. 7, 8.

Range: off north coast of Cuba.
Depth: 375 to 439 m (205 to 240 fm).
Remarks: Chace (1940) reported an ovigerous female from off Cuba, taken in May at 240 fm.

Cymonomus A. Milne Edwards, 1880

Cymonomus caecus Chace, 1940 (Torreia 3: 12)

Chace, 1940, p. 12, figs. 1–2.

Range: north coast of Cuba.
Depth: 841 m (460 fm).

Cymonomus cubensis Chace, 1940 (Torreia 3: 16)

Chace, 1940, p. 16, figs. 5–6.

Range: north coast of Cuba.
Depth: 475 to 1006 m (260 to 550 fm).
Remarks: Chace (1940) reported ovigerous females from off Cuba in March and May. He feels that this species is a possible link between the genera *Cymonomus* and *Cymopolus* and it may be eventually elevated to generic status when studied further.

Cymonomus quadratus A. Milne Edwards, 1880 (Bull. Mus. Comp. Zool. 8: 26)

Rathbun, 1933, p. 106, fig. 104; Rathbun, 1937, p. 98, text-fig. 23, pl. 30, fig. 3, pl. 31, fig. 3.

Range: northwest of Dry Tortugas; west, north and south coasts of Cuba; Puerto Rico; Lesser Antilles, from St. Croix to Grenada.
Depth: 185 to 929 m (101 to 508 fm).
Habitat: soft bottoms, fine sand, mud, and ooze.

Cymonomus rostratus Chace, 1940 (Torreia 3: 14)

Chace, 1940, p. 14, figs. 3, 4.

Range: north coast of Cuba.
Depth: 658 m (360 fm).

Cymopolus A. Milne Edwards, 1880

(This genus should not be confused with *Cymopolia* Roux, a synonym of *Palicus* Phillipi, of the family Palicidae)

Cymopolus agassizi A. Milne Edwards & Bouvier, 1899 (Bull. Mus. Hist. Nat., Paris 5: 385)

Rathbun, 1937, p. 100, pl. 30, fig. 2, pl. 31, fig. 2.

Range: Florida Straits; Florida Keys; Puerto Rico.
Depth: 128 to 549 m (70 to 300 fm).
Habitat: sand and rocky bottoms.

Remarks: Rathbun (1937) lists ovigerous females from off Florida in February and March.

Ethusa Roux, 1828

Ethusa mascarone americana A. Milne Edwards, 1880 (Bull. Mus. Comp. Zool. 8: 30)

Rathbun, 1933, p. 105, fig. 102; Rathbun, 1937, p. 78, pl. 22, fig. 2, pl. 23, fig. 2; Williams, McCloskey & Gray, 1968, p. 43, fig. 2.

Range: North Carolina; Florida Keys and Dry Tortugas: west coast of Florida; Puerto Rico; Virgin Islands; Maranhão to Bahia, Brazil; Gulf of California and the Pacific coast of Panama.

Depth: shallow water to 82 m (to 45 fm).

Habitat: rock, coral, coarse shell, and sand substrates; from surfaces of algae, bryozoans, and seaweeds.

Remarks: Abele (1970) remarks on the need for revision of this species and its subspecies, noting the variation in growth of critical characters, also cited by Finnegan (1931) and Garth (1966). Williams, McCloskey and Gray (1968) observed a specimen in the laboratory, taken from a reef off North Carolina, that clasped objects over its carapace, in the manner of dromiid crabs and similar to that reported for *E. lata* in the Pacific (Garth, 1946). Listed from Brazil by Rodrigues da Costa (1968a) and Coelho and Ramos (1972).

Ethusa microphthalma Smith, 1881 (Proc. U.S. Nat. Mus. 3: 418)

Rathbun, 1937, p. 82, pl. 22, fig. 3, pl. 23, fig. 3; Chace, 1940, p. 10; Pequegnat, 1970, p. 175.

Range: Massachusetts to North Carolina; Dry Tortugas; off west coast of Florida; off Mississippi; off east coast of Mexico and Tabasco (Gulf); north and south coasts of Cuba; northeast Caribbean Sea.

Depth: 110 to 752 m (60 to 411 fm).

Habitat: soft bottoms, fine sand, mud, and mud with shell.

Remarks: Listed from the Gulf of Mexico by Chace (1956) and from Texas by Leary (1967), but not by Felder (1973a) who didn't include deep sea species. Rathbun (1937) reported ovigerous females from off Dry Tortugas in July.

Ethusa tenuipes Rathbun, 1897 (Proc. Biol. Soc. Washington 11: 110)

Rathbun, 1937, p. 87, pl. 24, fig. 3, pl. 25, fig. 3; Chace, 1940, p. 11; Williams, McCloskey & Gray, 1968, p. 44.

Range: off North Carolina; east coast of Florida; Florida Keys and Dry Tortugas; off Alabama; north and south coasts of Cuba.

Depth: 46 to 402 m (25 to 220 fm).

Habitat: sand and coral bottoms.

Remarks: Rathbun (1937) reported ovigerous females from North Carolina in July, from off Cuba in April, and from off Dry Tortugas in July.

Ethusa truncata A. Milne Edwards & Bouvier, 1899 (Bull. Mus. Hist. Nat., Paris 5: 384)

Rathbun, 1937, p. 85, pl. 28, figs. 1–2.

Range: off west coast of Florida; off Mississippi Delta and Louisiana; northwest of Trinidad.

Depth: 133 to 219 m (73 to 119 fm).

Ethusina Smith, 1884

Ethusina abyssicola Smith, 1884 (Rept. U.S. Comm. Fish Fisher. 1882, p. 349 (1884))

Rathbun, 1937, p. 91, text-fig. 21, pl. 26, fig. 1, pl. 27, fig. 1; Pequegnat, 1970, p. 175, fig. 6–2.

Range: Massachusetts to North Carolina; in deep waters of northwest, northeast, and southwest quadrants of Gulf of Mexico; off Cape Frio, Brazil; off west coast of Spain.

Depth: 860 to 4061 m (470 to 2220 fm).

Habitat: very soft bottoms, muds and oozes.

Remarks: Pequegnat (1970) presents evidence for two modes of bathymetric distribution, one at 860 to 1399 m (470 to 765 fm) with specimens resembling typical *E. abyssicola*, and a deeper mode at 2551 to 4061 m (1395 to 2220 fm) with specimens that approach *E. faxonii* in size and shape of exorbital teeth. Further studies may reveal two distinct species. Pequegnat (1970) also reports that an ovigerous female with a few advanced embryos was collected at 765 fm in mid-November.

Superfamily CALAPPOIDEA de Haan, 1833

Family CALAPPIDAE de Haan, 1833

Subfamily CALAPPINAE de Haan, 1833

Acanthocarpus Stimpson, 1871

Acanthocarpus alexandri Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 153)

Rathbun, 1937, p. 221, pl. 69, figs. 1–2; Chace, 1940, p. 26; Williams, 1965, p. 156, fig. 137; Pequegnat, 1970, p. 177, fig. 6–3.

Range: Massachusetts; North Carolina to south Florida; Florida Keys and Dry Tortugas; west and northwest Florida; Mississippi; Texas; east coast of Mexico; north coast of Cuba; Puerto Rico to the Grenadines; off Brazil.

Depth: 68 to 476 m (37 to 260 fm).

Habitat: primarily soft bottoms, fine sand, mud and ooze.

Remarks: Chase (1940) and Pequegnat (1970) note that the carapace of this species is broader than long, contrary to the description of Rathbun (1937). Chace (1956) listed this species from the Gulf of Mexico collections of the R/V

Oregon and Pequegnat (1970) reported this crab as the most abundant deep water calappid from the *Alaminos* collections. Rathbun (1937) listed ovigerous females from off Florida in June and Pequegnat (1970) listed the same from the deep Gulf in early August to mid-November. Listed from Brazil by Coelho and Ramos (1972).

Acanthocarpus bispinosus A. Milne Edwards, 1880 (Bull. Mus. Comp. Zool. 8: 19)

Rathbun, 1937, p. 224, pl. 68, figs. 1–3.

Range: off west and northwest coasts of Florida; Dry Tortugas; Grenadines, Windward Islands.

Depth: 201 to 360 m (110 to 197 fm).

Habitat: mud-shell, coral, and clay-mud bottoms.

Remarks: The depth and location records off Florida for the R/V *Oregon* stations (Chace, 1956) may be confused. Stations 1007 and 1010 are positioned well within the 100 fm isobath, yet the depths for these stations are listed at 180 and 225 fm, respectively.

Calappa Weber, 1795

Calappa angusta A. Milne Edwards, 1880 (Bull. Mus. Comp. Zool. 8: 18)

Hay & Shore, 1918, p. 421, pl. 31, fig. 7; Rathbun, 1937, p. 210, pl. 64, figs. 1–6; Williams, 1965, p. 154, fig. 134; Pequegnat, 1970, p. 177.

Range: North Carolina; southeast Florida; Florida Keys and Dry Tortugas; west coast of Florida and mid-eastern Gulf of Mexico; off east coast of Mexico; off North coast of Yucatan; St. Thomas to Grenada; Barbados.

Depth: 13 to 274 m (7 to 150 fm).

Habitat: coral, sand, broken shell, and gravel substrates.

Remarks: Rathbun (1937) reported ovigerous females from southern Florida in March. Chace (1956) recorded this species from the eastern Gulf of Mexico and Williams (1965) stated that this crab is more abundant in the Gulf Stream than in adjacent inshore waters. Shoup (1968) described shell opening behavior by this species.

Calappa flammea (Herbst, 1794) (Versuch Naturgesch. Krabben u. Krebse, vol. 2, p. 161)

Common Names: Flame-streaked Box Crab; Shame-faced Crab

Hay & Shore, 1918, p. 421, pl. 31, fig. 8; Rathbun, 1933, p .103; Rathbun, 1937, p. 198 (part), pl. 59, figs. 1–2, pl. 60, fig. 1; Reed, 1941, p. 44; Holthuis, 1958, p. 148, figs. 28–35; Williams, 1965, p. 152, figs. 130–131; Felder, 1973a, p. 43, pl. 5, fig. 11.

Range: Massachusetts to south Florida (see Remarks); Bermuda; Bahamas; Florida Straits and Keys; Dry Tortugas; west and northwest Florida; all inshore Gulf of Mexico areas from Florida to Yucatan, Mexico.

Depth: shore to 73 m (to 40 fm), rarely to 229 m (125 fm).

Habitat: hard bottoms, primarily sand.

Remarks: The breeding range for this crab extends only to North Carolina, but larvae as far north as New England may occasionally survive a mild winter to provide temporary range extensions (Hay and Shore, 1918; Holthuis, 1958). Some of the larval stages are figured by Lebour (1944). This species was revised by Holthuis (1958), who found at least two species that had been previously combined under this name. One of these, *C. ocellata*, also occurs in the Gulf of Mexico, thus previous records, particularly from off west Florida, may refer to either or both species. Listed from the R/V *Oregon* collections in the Gulf by Chace (1956). Cheliped modifications associated with shell opening of molluscs were described by Shoup (1968).

Calappa gallus (Herbst, 1803) (Versuch Naturgesch. Krabben u. Krebse, vol. 3, pt. 3, pp. 18 and 46)

Common Name: Yellow Box Crab

Rathbun, 1933, p. 103; Rathbun, 1937, p. 214, pl. 65, figs. 2–3; Barnard, 1950, p. 350, fig. 66e–i; Sakai, 1965, p. 55, pl. 21, fig. 3; Fausto Filho, 1967, p. 48, fig. 4, pl. VI, figs. 7–8; Sakai, 1976b, p. 131, pl. 39, fig. 2.

Range: Bermuda; Bahamas; Florida Keys and Dry Tortugas; northwest Cuba; Jamaica; Puerto Rico; St. Croix to Barbados; off Campeche snapper banks (Gulf of Mexico); Panama (Carib.) to Venezuela; Netherlands Antilles; Ceará to Bahia, Brazil; St. Helena Island (So. Atlantic); off western Africa, from Senegal to Angola; South Africa; Red Sea; Reunion and Seychelles, in Persian Gulf; off India and Maldives; Philippines; Formosa; Japan; Marshall Inlands; Samoa; Hawaiian Islands.

Depth: low tide mark to 218 m (to 119 fm).

Habitat: hard substrates; on reef flats; coral, sand, shell and rock bottoms.

Remarks: Barnard (1950) and Sakai (1965) provide some earlier references for the African and Asian areas, respectively. Coelho and Ramos (1972) and Fausto Filho (1974) list Brazilian records for this species.

Calappa ocellata Holthuis, 1958 (Stud. Fauna Curaçao 8: 158)

Rathbun, 1901, p. 84 (part), pl. 2; Verrill, 1908, p. 420 (part), pl. 25, fig. 1; Rathbun, 1937, p. 198 (part), not pl. 59 or 60; Holthuis, 1958, p. 158, figs. 36–40; Williams, 1965, p. 153, figs. 132–133.

As ***C. ocelata***—Fausto Filho, 1967, p. 42, fig. I, pl. 1, figs. 1–2.

Range: Bermuda; off North Carolina and in Beaufort Harbor (rare); Florida Keys and Dry Tortugas; Jamaica; Hispaniola; Puerto Rico; Virgin Islands; Caribbean coasts of Panama and Colombia; Netherlands Antilles; Rocas to Pernambuco, Brazil.

Depth: shallow water to 52 m (to 28 fm).

Remarks: Plates 59 and 60 of Rathbun (1937) are of *C. flammea*, not *C. ocellata*. Other records of *C. flammea* may also include specimens of this species, especially reports prior to the revision by Holthuis (1958). Shoup (1968) described shell opening behavior by this species and other *Calappa*. Coelho and Ramos (1972) list this crab from Brazil.

Calappa springeri Rathbun, 1931.

This species proved to be identical to *C. sulcata* Rathbun, 1898 when examined by Holthuis (1958) and so this name is a junior synonym. Rathbun's earlier description was based on a juvenile of the species and her later description, as *C. springeri*, was based on an adult form. Many of the earlier Gulf of Mexico faunal surveys list *C. springeri* and these can all be referred to *Calappa sulcata.*

Calappa sulcata Rathbun, 1898 (Bull. Lab. Nat. Hist. State Univ. Iowa 4: 289)

Common Names: Yellow Box Crab; Shame-faced Crab; Parrot Crab.

As ***C. springeri***—Rathbun, 1937, p. 205, pl. 60, fig. 1, pl. 61, figs. 1–2.
As ***C. sulcata***—Rathbun, 1933, p. 103, fig. 99; Rathbun, 1937, p. 211, pl. 64, figs. 7–8, pl. 65, fig. 1; Holthuis, 1958, p. 179, figs. 51–54; Williams, 1965, p. 155, figs. 135–136; Fausto Filho, 1967, p. 46, fig. 3, pl. II, figs. 5–6; Felder, 1973a, p. 42, pl. 5, fig. 10.

Range: North Carolina; Chesapeake Bight; Dry Tortugas; Alabama to south Texas; Tabasco, Mexico; Puerto Rico; Venezuela to Surinam; Amapá to Sergipe, Brazil.

Depth: shore to 183 m (to 100 fm).

Habitat: sand and sand-mud bottoms.

Remarks: Listed from the Gulf of Mexico (some under *C. springeri*) by Chace (1956) and Fotheringham and Brunenmeister (1975), from Mississippi (Franks *et al.*, 1972), and off Texas (Gunter, 1950; Hildebrand, 1954; Leary, 1967). Hildebrand (1954) reported ovigerous females from Texas in May and that claws of this crab were occasionally served at restaurants in Port Aransas. A report of mollusc shell-opening by this and other *Calappa* species (Shoup, 1968) provides one of the few behavioral studies. Listed from Chesapeake Bight by Musick and McEachran (1972) and from Brazil by Coelho and Ramos (1972).

Cycloes de Haan, 1837

Cycloes bairdii Stimpson, 1860 (Ann. Lyc. Nat. Hist. New York 7: 237)

Rathbun, 1933, p. 101, fig. 98; Rathbun, 1937, p. 225, pl. 69, figs. 3–4; Garth, 1946, p. 362, pl. 62, figs. 7–8; Williams, McCloskey & Gray, 1968, p. 49, fig. 6.

Range: Bermuda; Bahamas; North Carolina; southeast Florida; Florida Keys and Dry Tortugas; Florida Straits; west coast of Florida; Cuba; Puerto Rico; St. Thomas to Barbados; Old Providence Island (Carib.); in the Pacific, from west coast of Mexico to Ecuador; Rocas to Espirito Santo, Brazil.

Depth: 3 to 229 m (1.5 to 125 fm).

Habitat: sand, rock, coral, and shell bottoms; buries in sand.

Remarks: Guinot-Dumortier & Dumortier (1961) described a stridulatory apparatus in this species and within the genus. Juvenile forms of this crab from Brazil were described by Rodrigues da Costa (1968b) and this species is also listed from Brazil by Coelho and Ramos (1972) and by Fausto Filho (1974).

Subfamily MATUTINAE Macleay, 1838

(Several genera of this subfamily, including *Hepatus* and *Osachila*, were

examined by Guinot (1966) and aligned with *Aethra* of the Parthenopidae, along with *Actaeomorpha* of the Leucosiidae. She proposed a new subfamily, Aethrinae, to contain these genera, pending further studies. The status of these changes is still in doubt, as is the status of the genus *Matuta* Weber, which is not represented in the Gulf of Mexico. Until such studies are available, *Hepatus* and *Osachila* are included within the Matutinae and they are listed with the other calappids, while recognizing their probable relationship to the Parthenopidae.)

Hepatus Latreille, 1802

Hepatus epheliticus (Johansson, in Linnaeus, 1763) (Amoenitates academicae, etc., vol. 6, p. 414)

Common Names: Calico Crab; Leopard Crab; Dolly Varden Crab

Hay & Shore, 1918, p. 422, pl. 37, fig. 1; Rathbun, 1937, p. 238, pl. 70, figs. 3–4, pl. 71, figs. 1–4; Williams, 1965, p. 158, fig. 140; Felder, 1973a, p. 43, pl. 5, fig. 14.

Range: Chesapeake Bay to south Florida; Florida Keys and Dry Tortugas; west coast of Florida to south Texas; Campeche Banks, off Yucatan; Cuba; Jamaica; Dominican Republic.

Depth: near shore to 46 m (to 25 fm).

Habitat: sand, sand-shell, and mud-sand substrates; found inside passes, channels, and harbors, but more common in shallow, open marine waters. Buries in substrate, probably nocturnal. Frequently collected with sea anemones attached to dorsal carapace.

Remarks: *Calliactis tricolor* is the most common anemone found on this crab, usually a single anemone located in the middle of the anterior margin, where the exhalent current of the crab induces a current over the anemone's basal disc (Carlgren and Hedgpeth, 1952). Larval development of this crab was studied by Costlow and Bookhout (1962). Gray (1957) measured the total gill area. Considerable variation exists in the dorsal carapace color patterns: some are spotted and others are marked with horizontal bands, including continuous gradations between these forms. Ovigerous females are not often collected, but have been reported off Texas in July (Hildebrand, 1954). Regional lists include Florida (Wass, 1955; Dragovich and Kelly, 1964; Abele, 1970; Menzel, 1971), Mississippi (Richmond, 1962; Franks *et al.*, 1972), Louisiana (Behre, 1950; Hoese and Valentine, 1972), Texas (Gunter, 1950; Hedgpeth, 1953; Hildebrand, 1954; Parker, 1959; Breuer, 1962; Leary, 1967), Campeche (Hildebrand, 1955), and offshore waters of the Gulf (Chace, 1956). Fotheringham and Brunenmeister (1975) summarize some of the natural history of this crab. Guinot (1966) reviews the taxonomic status of this and related genera.

Hepatus princeps (Herbst, 1794).

This name was determined to be a junior synonym of *H. pudibundus* (Herbst, 1785) in a revision by Holthuis (1959, p. 167). Rathbun (1937) and earlier regional surveys use the junior name and these are referred to *H. pudibundus*.

Hepatus pudibundus (Herbst, 1785) (Versuch Naturgesch. Krabben u. Krebse, vol. 1, p. 199)

As ***H. princeps***—Rathbun, 1933, p. 104, fig. 101; Rathbun, 1937, p. 235, pl. 70, figs. 1–2.
As ***H. pudibundus***—Holthuis, 1959, p. 167, figs. 36–37, 38a–b; Williams, 1965, p. 157, figs. 138–139; Guinot, 1966, p. 755, figs. 9, 18, 30; Fausto Filho, 1967, p. 50, fig. 5, pl. II, figs. 9–10; Felder, 1973a, p. 43, pl. 5, fig. 13.

Range: off Georgia; off Louisiana and Texas; north and south coasts of Cuba; Jamaica; Haiti; Puerto Rico; St. Thomas to Guadeloupe; Panama (Carib.); Surinam; Bahia to Santa Catarina, Brazil; off Guinea, western Africa; Cape of Good Hope, South Africa.

Depth: shore to 49 m (to 27 fm).

Habitat: very shallow waters with sand-mud and shell-mud bottoms. Often carries anemones and barnacles on carapace.

Remarks: The systematic status of this species and the genus have been reviewed by Holthuis (1959) and by Guinot (1966). Holthuis reported ovigerous females from Surinam in April. Behre (1950) collected this crab at Grand Isle, Louisiana, only once or twice, from among oyster beds. Leary (1967) lists this species from Texas and Felder (1973a) confirms this with a record of his own. Nomura and Fausto Filho (1966) reported biometric data on this crab from Brazil and additional Brazilian records were provided by Rodrigues da Costa (1968a) and Coelho and Ramos (1972).

Osachila Stimpson, 1871

(See remarks under Matutinae with regard to this genus and *Hepatus*.)

Osachila antillensis Rathbun, 1898 (Bull. Lab. Nat. Hist. State Univ. Iowa 4: 290)

Rathbun, 1933, p. 104, fig. 100; Rathbun, 1937, p. 251, pl. 77, fig. 2.

Range: north coast of Cuba; St. Croix, Virgin Islands; Montserrat; Dominica; Barbados; Grenada.

Depth: 123 to 304 m (67 to 164 fm).

Habitat: sand, shell, coral, and rock substrates; on sand-mud bottoms.

Osachila semilevis Rathbun, 1916 (Proc. U.S. Nat. Mus. 50: 652)

Hay & Shore, 1918, p. 422, pl. 31, fig. 9; Rathbun, 1937, p. 251, pl. 77, fig. 1; Williams, 1965; p. 159, fig. 142.

Range: North Carolina; Dry Tortugas; northwest Florida.

Depth: 2 to 91 m (1 to 50 fm).

Habitat: sand, shell, and rocky bottoms.

Remarks: Williams (1965) reports that this species has been collected north of Florida only twice, both times in the Beaufort, North Carolina area. He also reports ovigerous females from Florida in July. Listed from Florida by Wass (1955) and Abele (1970), but not by Menzel (1971).

Osachila tuberosa Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 154)

Hay & Shore, 1918, p. 423, pl. 31, fig. 10; Rathbun, 1937, p. 250, pl. 77, fig. 3;

Williams, 1965, p. 159, fig. 141; Guinot, 1966, p. 748, figs. 3, 15, 17, 27, 31, 34, 35; Pequegnat, 1970, p. 178.

Range: North Carolina (rare); Florida Keys and Dry Tortugas; south and west coasts of Florida; eastern portions of the Gulf of Mexico.

Depth: 66 to 183 m (36 to 100 fm), but more common at the shallower end of its bathymetric range.

Remarks: Listed from the Gulf of Mexico by Chace (1956) for the R/V *Oregon* collections.

Family LEUCOSIIDAE Samouelle, 1819

Subfamily EBALIINAE Stimpson, 1871

Ebalia Leach, 1817

Ebalia cariosa (Stimpson, 1860) (Ann. Lyc. Nat. Hist. New York 7: 238)

Rathbun, 1937, p. 125, pl. 35, figs. 6–7; Williams, 1965, p. 147, fig. 122.

Range: North Carolina; southeast Florida; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; Jamaica; northeastern South America to São Paulo, Brazil.

Depth: low tide mark to 131 m (to 72 fm).

Habitat: from coral, rock, sand, and broken shell substrates.

Remarks: Florida listings include Wass (1955), Tabb & Manning (1961), Rouse (1970), Abele (1970), Lyons *et al.* (1971), and Menzel (1971). Williams (1965) reports ovigerous females from North Carolina throughout the summer and he notes the death-feigning behavior of this crab when it is captured. The crab resembles pebbles and shell pieces with which it is associated. Listed from Brazil by Coelho and Ramos (1972).

Ebalia stimpsoni A. Milne Edwards, 1880 (Bull. Mus. Comp. Zool. 8: 22)

Rathbun, 1933, p. 100, fig. 96; Rathbun, 1937, p. 124, text-fig. 33, pl. 35, figs. 1–3, pl. 37, figs. 1–3; Williams, McCloskey & Gray, 1968, p. 46.

Range: off North Carolina; Bahamas; Florida Keys and Dry Tortugas; west coast of Florida; Puerto Rico; Barbados; Maranhão to Bahia, Brazil.

Depth: 7 to 183 m (4 to 100 fm).

Habitat: sand, shell, and coral bottoms.

Remarks: Listed from Florida by Hulings (1961) and Abele (1970). Williams, McCloskey and Gray (1968) reported an ovigerous female from off North Carolina in May. Listed from Brazil by Rodrigues da Costa (1968a) and by Coelho and Ramos (1972).

Lithadia Bell, 1855

Lithadia cadaverosa *Stimpson*, 1871 (Bull. Mus. Comp. Zool. 2: 159)

Rathbun, 1937, p. 137, pl. 38, figs. 3–6.

Range: Bahamas; northwest coast of Florida and northeast portion of Gulf.

Depth: 46 to 62 m (25 to 34 fm).
Habitat: sand, broken shell, and gravel substrates.

Speloeophorus A. Milne Edwards, 1865

Speloeophorus elevatus Rathbun, 1898 (Bull. Lab. Nat. Hist. State Univ. Iowa 4: 290)

Rathbun, 1937, p. 145, pl. 39, figs. 7–9.

Range: Florida Keys; Jamaica; off Cape St. Roque and from Maranhão to Alagoas, Brazil.
Depth: 1 to 83 m (1 to 45 fm).
Habitat: broken shell substrate.
Remarks: Listed from Brazil by Coelho (1971a) and Coelho and Ramos (1972).

Speloeophorus nodosus (Bell, 1855) (Trans. Linn. Soc. London 21: 307)

Hay & Shore, 1918, p. 425, pl. 32, fig. 5; Rathbun, 1933, p. 99, fig. 95; Rathbun, 1937, p. 142, pl. 40, figs. 1–5; Williams, 1965, p. 148, figs. 123–124.

Range: North Carolina; Florida Keys and Dry Tortugas; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; Guadeloupe.
Depth: 3 to 18 m (1.5 to 10 fm).
Habitat: coral reefs and coral-sand bottoms.
Remarks: Williams (1965) states that this species is rare in the northern part of its range and he cites a report by Pearse and Williams (1951) of its occurrence on a reef off North Carolina. This crab readily feigns death when captured.

Speloeophorus pontifer (Stimpson, 1871) (Ann. Lyc. Nat. Hist. New York 10: 115)

Hay & Shore, 1918, p. 425, pl. 32, fig. 5; Rathbun, 1933, p. 100; Rathbun, 1937, p. 144, pl. 39, figs. 1–3; Williams, 1965, p. 149, figs. 125–126.

Range: off North Carolina; Florida Keys and Dry Tortugas; west coast of Florida; Cuba; Puerto Rico; Barbados.
Depth: low tide mark to 229 m (to 125 fm).
Habitat: coral, sand, and shell bottoms.

Uhlias Stimpson, 1871

Uhlias limbatus Stimpson, 1871 (Ann. Lyc. Nat. Hist. New York 10: 118)

Rathbun, 1937, p. 150, pl. 36, figs. 3–5.

Range: west of Key West, Florida; north coast of Cuba; Jamaica; Haiti; St. Thomas, Virgin Islands.
Depth: 4 to 64 m (2 to 35 fm).
Habitat: shell and grassy substrates.

Subfamily LEUCOSIINAE Samouelle, 1819

Callidactylus Stimpson, 1871

Callidactylus asper Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 158)

Rathbun, 1937, p. 193, pl. 58, figs. 1–3; Williams, McCloskey & Gray, 1968, p. 48, fig. 5.

Range: off North Carolina; southeast Florida; Florida Keys and Dry Tortugas; off southwest Florida; east coast of Haiti; Maranhão to Alagoas, Brazil.

Depth: 27 to 91 m (15 to 50 fm).

Habitat: sand substrates; off *Lithothamnium* reef.

Remarks: Listed from Brazil by Coelho (1971a, 1971b) and Coelho and Ramos (1972). See remarks for *Iliacantha liodactylus*.

Iliacantha Stimpson, 1871

Iliacantha intermedia Miers, 1886 (Voyage of H.M.S. *Challenger*, Brachyura, vol. 17, p. 302.

Hay & Shore, 1918, p. 424, pl. 32, fig. 3; Rathbun, 1937, p. 186, pl. 54, figs. 1–2; Williams, 1965, p. 151, fig. 129.

Range: North Carolina; Florida Keys and Dry Tortugas; northwest coast of Florida; St. Thomas, Virgin Islands; off Venezuela; from Maranhão to Bahia, Brazil.

Depth: 10 to 329 m (5.5 to 180 fm).

Habitat: sand, gravel, coral, and broken shell bottoms.

Remarks: Williams (1965) comments on the close resemblance between juveniles of this species and those of *Persephona mediterranea*. Listed from Brazil by Coelho (1971a) and Coelho and Ramos (1972).

Iliacantha liodactylus Rathbun, 1898 (Bull. Lab. Nat. Hist. State Univ. Iowa 4: 291)

Rathbun, 1937, p. 186, text-fig. 41, pl. 55, figs. 1–2; Felder, 1973a, p. 39, pl. 5, fig. 2.

Range: west coast of Florida; ? Haiti; Puerto Rico; St. John, Virgin Islands; Trinidad; Alagoas to Bahia, Brazil.

Depth: 9 to 130 m (5 to 71 fm).

Habitat: mud substrates.

Remarks: Recorded by Chace (1956) from the R/V *Oregon* cruise in the Gulf of Mexico. The locality records cited for this species and for *Callidactylus asper* by Rathbun (1937) are not in agreement with the latitudes and longitudes listed. Both species are listed from the east coast of Haiti, as recorded by the Johnson-Smithsonian Expedition of 1933, but the coordinates as listed would place *C. asper* east of Puerto Rico and place *I. liodactylus* on the east coast of the Dominican Republic. Leary (1967) lists *I. liodactylus* from Texas and Felder (1973a) repeats Leary's listing, but I know of no published collection records to verify the presence of this species in the northwestern Gulf. Listed from Brazil by Coelho (1971b) and Coelho and Ramos (1972).

Iliacantha sparsa Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 156)

Rathbun, 1937, p. 190, pl. 56, figs. 1–2.

Range: northwest of the Dry Tortugas; off north and southeast coasts of Puerto Rico; Barbados; Maranhão to Bahia, Brazil.

Depth: 23 to 73 m (13 to 40 fm).

Habitat: gravel, shell, and coral bottoms; on calcareous algae.

Remarks: Only male specimens were listed by Rathbun (1937), one of which was heavily infested with parasites. Listed from Brazil by Coelho (1971a) and Coelho and Ramos (1972).

Iliacantha subglobosa Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 155)

Hay & Shore, 1918, p. 424, pl. 32, fig. 2; Rathbun, 1937, p. 185, pl. 53, figs. 1–2; Williams, 1965, p. 150, fig. 128; Pequegnat, 1970, p. 179.

Range: North Carolina; southeast Florida; Florida Keys and Dry Tortugas; northwest Florida; north coast of Cuba; Jamaica; Lesser Antilles, from Montserrat to Barbados; from Amapá to Alagoas, Brazil.

Depth: 27 to 393 m (15 to 215 fm).

Habitat: coral, sand, and rock bottoms.

Remarks: Listed by Chace (1956) from the Gulf of Mexico. Williams (1965) reported ovigerous females from the Gulf in June. Brazilian records include Coelho (1971a, 1971b) and Coelho and Ramos (1972).

Subfamily PHILYRINAE Rathbun, 1937

Myropsis Stimpson, 1871

Myropsis quinquespinosa Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 157)

Rathbun, 1937, p. 164, pl. 46, figs. 1–3; Chace, 1940, p. 24; Williams, McCloskey & Gray, 1968, p. 46, fig. 4; Pequegnat, 1970, p. 179; Felder, 1973a, p. 39, pl. 5, fig. 5.

Range: Massachusetts; North Carolina; Bahamas; southeast Florida; Florida Keys and Dry Tortugas; west coast of Florida; all portions of Gulf of Mexico; off Alabama, Texas, and Campeche Bank in Mexico; north and south coasts of Cuba; Jamaica; Puerto Rico; Lesser Antilles, from Martinique to Grenada; Barbados; Venezuela.

Depth: 91 to 329 m (50 to 185 fm), rare report to 1045 m (572 fm).

Habitat: commonly on mud bottoms, also on sand and shell substrates.

Remarks: Rathbun (1937) reported ovigerous females from Florida in May and July and Williams, McCloskey and Gray (1968) reported an ovigerous female from off North Carolina in July, where they believe this species is restricted to a depth range of 120 to 160 m. Chace (1956) recorded this crab from 50 fm off Sabine, Texas and it is listed from Texas by Leary (1967). Pequegnat (1970) notes that the depth record of 572 fm may be excessive.

Persephona Leach, 1817

Persephona aquilonaris Rathbun, 1933.

This name was given to the western Atlantic species, including the Gulf of Mexico form, orginally to indicate a subspecies of *P. punctata*. A revision of the genus by Guinot-Dumortier (1959) indicated that the two forms were distinct species and she extended the range through the Caribbean to South America, where it co-exists with *P. punctata*. Rathbun (1937) had restricted *P. punctata aquilonaris* to North America. At the same time as her revision, Guinot-Dumortier (1959) indicated that the species illustrated by Herbst, *P. mediterranea*, may be the correct name of *P. aquilonaris*. Rathbun (1937, p. 153) listed *P. mediterranea* as a synonym of *P. punctata*, but she indicated that the type locality (Mediterranean Sea) was probably incorrect. Abele (1970) reviews the synonymy and notes that L. B. Holthuis verified the identity and synonymy of *P. mediterranea* and *P. aquilonaris*. Abele (1970) also notes that the figure in Rathbun (1933, p. 99, fig. 94) for *P. punctata* from Puerto Rico is a figure of *P. mediterranea*.

Persephona crinita Rathbun, 1931 (J. Washington Acad. Sci. 21: 128)

Rathbun, 1937, p. 163, pl. 43, figs. 2–3, pl. 44, figs. 1–3; Felder, 1973a, p. 39, pl. 5, fig. 3.

Range: northwest Florida to Texas; Trinidad; Ilha São Sebastião, Brazil.
Depth: 5.5 to 91 m (3 to 50 fm).
Habitat: mud and mud-sand bottoms; more common in open marine waters than is *P. mediterranea*.

Remarks: Hildebrand (1954) collected an ovigerous female from off Texas in June. Wass (1955) stated that this species is rarer than P. *aquilonaris* (= *P. mediterranea*) off northwest Florida and Menzel (1971) listed this crab as uncommon on sand bottoms in the same area. Franks *et al.* (1972) extended the known depth range to 50 fm, from collections off Mississippi. Listed from the Gulf collections of the R/V *Oregon* by Chace (1956).

Persephona mediterranea (Herbst, 1794) (Versuch Naturgesch. Krabben u. Krebse, vol. 2, p. 150)

Common Name: Purse Crab

As ***P. punctata***—Hay & Shore, 1918, p. 423, pl. 32, fig. 9 (part); Rathbun, 1933, p. 99 (part), fig. 94.
As ***P. punctata aquilonaris***—Rathbun, 1937, p. 154, pl. 42, figs. 6–7; Williams, 1965, p. 150, fig. 127.
As ***P. aquilonaris***—Guinot-Dumortier, 1959, p. 429, figs. 7, 9; Felder, 1973a, p. 42, pl. 5, fig. 4.
As ***P. mediterranea***—Abele, 1970, p. 62.

Range: New Jersey to south Florida; Dry Tortugas; west coast of Florida to south Texas; off Campeche, Mexico; Guadeloupe, Lesser Antilles; French Guiana; Santa Catarina, Brazil.
Depth: 4 to 55 m (2 to 30 fm).

Habitat: sand, shell, and coral bottoms; inshore waters, in passes; in very shallow water just below low tide mark; from mud-shell substrates in northwestern Gulf of Mexico.

Remarks: For explanation of nomenclatural revisions, see *P. aquilonaris*. Williams (1965) reported abundant colonies of this crab, with ovigerous females present throughout the spring and summer in North Carolina waters. Regional listings include the Gulf (Chace, 1956; Fotheringham and Brunenmeister, 1975), Florida (Wass, 1955; Tabb and Manning, 1961; Dragovich and Kelly, 1964), Louisiana (Behre, 1950), and Texas (Hedgpeth, 1953; Hildebrand, 1954; Leary, 1967).

Persephona punctata aquilonaris Rathbun, 1933.

Revised by Guinot-Dumortier (1959) to a separate species and later determined to be a junior synonym of *P. mediterranea* (Herbst). See *P. aquilonaris* for nomenclatural discussion.

SECTION HAPALOCARCINIDEA Verrill, 1908

Superfamily HAPALOCARCINOIDEA (Verrill, 1908)

Family HAPALOCARCINIDAE Calman, 1900

(The taxonomic status of these unique crabs is uncertain. Verrill (1908, p. 426) proposed the designation "Hapalocarcinidea" for "a peculiar superfamily," apparently including them among the Oxystomata. Glaessner (1969) does not include this group in his classification schemes. Chace (personal comm.) has suggested the retention of "Hapalocarcinidea" for a section name and the appropriate ending for the superfamily name, both of which are credited to Verrill. The status and relationships of the hapalocarcinids will undoubtably change with further study.)

Cryptochirus Heller, 1861

Cryptochirus corallicola (Verrill, 1908) (Trans. Connecticus Acad. Arts Sci. 13:427)

Rathbun, 1937, p. 262 (part), text-fig. 47, pl. 78, figs. 5–7.

Range: Florida Straits; Dry Tortugas; Bermuda; Dominica; Maranhão to Bahia, Brazil.

Depth: 0 to 75 m (0 to 41 fm).

Habitat: in ovoid cavities in the upper surfaces of corals, such as *Meandra areolata* and *Meandrina* sp.

Remarks: Serene (1966) reviews the taxonomy and geographical distribution of hapalocarcinids. Rathbun (1937) commented on the relationship between the crabs and their living coral habitat: "the opening of the den is usually semicircular or lunate, commonly oblique to surface of coral. The downturned, rough,

and dirt-covered front of the crab serves as an operculum, closing the aperture. Full grown crabs are probably unable to leave their dens." The western African record listed by Rathbun (1937) was referred to *Troglocarcinus balssi* by Monod (1956). Listed from Brazil (as *Troglocarcinus corallicola*) by Coelho (1971a) and Coelho and Ramos (1972). Fausto Filho (1974) provides some habitat notes and extended the known depth to 75 m, based on Brazilian specimens collected by Coelho.

SECTION OXYRHYNCHA Latreille, 1803

Family MAJIDAE Samouelle, 1819

Subfamily ACANTHONYCHINAE Stimpson, 1870

Acanthonyx Latreille, 1825

Acanthonyx petiverii H. Milne Edwards, 1834 (Hist. Nat. Crust., vol. 1, p. 343)

Rathbun, 1925, p. 142, text-fig. 52, pl. 44, pl. 222, figs. 1–6; Rathbun, 1933, p. 13, fig. 11; Garth, 1958, p. 225, pl. O, fig. 3, pl. 25, fig. 2; Felder, 1973a, p. 53, fig. 14.

Range: Bahamas; southeast and northwest Florida; Texas; Cuba; Jamaica; Puerto Rico; Virgin Islands; Netherlands Antilles; Panama (Carib.) to Rio de Janeiro, Brazil; along the Pacific coast, from Baja California to Caldera, Chile; Galapagos Islands.

Depth: shore to 29 m (16 fm).

Habitat: in tide pools of rocky, surf-beaten shores; algal-covered surfaces and on seaweeds; sandy shores; coral flats.

Remarks: Leary (1967) lists this crab from Texas and Felder (1973a) found this crab on rock jetties in southern Texas. Chace (1966) figured four types of carapace variation in this species. Abele (1970) also collected this crab, a single female, from seaweed on jetties in northwest Florida. Listed from Brazil by Coelho (1971a, 1971c) and Coelho and Ramos (1972).

Epialtus H. Milne Edwards, 1834

Epialtus bituberculatus H. Milne Edwards, 1834 (Hist Nat. Crust., vol. 1, p. 345)

Rathbun, 1925, p. 148, text-figs. 53a, 54, pl. 45, figs. 3–4; Rathbun, 1933, p. 14, fig. 15; Garth, 1958, p. 228.

Range: east coast of Florida; Key West, Florida; Puerto Rico; Panama (Carib.) to Colombia; Ceará to Pernambuco, Brazil.

Depth: shallow waters.

Habitat: like others of this genus, on hard surfaces and in tide pools, feeding among seaweed and other plant growth.

Remarks: Although this species has been listed from Chile and from southern California, Garth (1958) recognizes an exclusively Atlantic range. Listed from Brazil by Coelho (1971c) and Coelho and Ramos (1972).

Epialtus dilatatus A. Milne Edwards, 1878 (Crust. Rég. Mex., p. 140)

Rathbun, 1925, p. 153, text-fig. 53j, pl. 45, fig. 2; Rathbun, 1933, p. 15, fig. 14; Williams, 1965, p. 249, figs. 228, 233D.

Range: North Carolina; Bahamas; south Florida; Dry Tortugas; Isla Mujeres, Yucatan (Carib.); Puerto Rico; St. Thomas, Virgin Islands.

Depth: 5 to 22 m (2.5 to 12 fm).

Habitat: sand, coral, and broken shell substrates.

Remarks: Yang (1968) describes the development of this crab to the first adult stage under laboratory conditions. The taxonomic status of the elongated form is still unclear and is described separately below.

Epialtus dilatatus forma ***elongata*** Rathbun, 1923 (Proc. Biol. Soc. Washington 36: 72)

Rathbun, 1925, p. 154, fig. 53k, pl. 48.

Range: Florida Keys; south, west, and northwest coasts of Florida.

Depth: 2 to 14 m (1 to 7.5 fm).

Habitat: on sandy bottoms with grass; in patches of *Sargassum*.

Remarks: Abele (1970) notes the considerable variation in this species and genus and he expresses reservations about the distinct status of this form. Florida listings include Wass (1955), Abele (1970), Menzel (1971), and Lyons *et al.*, (1971). Wass (1955) collected this crab from *Sargassum*, off Ochlockonee Bay, Florida. Rathbun (1925) reported ovigerous females from Florida in January and February; other records include ovigerous females from Florida in March and July.

Epialtus longirostris Stimpson, 1860 (Ann. Lyc. Nat. Hist. New York 7: 199)

Rathbun, 1925, p. 151, text-figs. 53g, 56.

Range: Key West and west coast of Florida; Cuba; Jamaica; St. Thomas, Virgin Islands; northeast Brazil.

Depth: shallow water, 3 to 5 m (2 to 3 fm) off Cuba; 19 to 54 m (10 to 30 fm) off Brazil.

Remarks: Listed from Brazil by Coelho (1971c).

Mocosoa Stimpson, 1871

Mocosoa crebripunctata Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 128)

Rathbun, 1925, p. 159, text-fig. 59, pl. 49, figs. 3–4.

Range: Florida Straits; off Cape San Blas, northwest Florida; Maranhão to Espirito Santo, Brazil.

Depth: 27 to 131 m (15 to 72 fm).

Remarks: Listed from Brazil by Coelho (1971a) and by Coelho and Ramos (1972).

Subfamily INACHINAE Macleay, 1838

Aepinus Rathbun, 1897

Aepinus septemspinosus (A. Milne Edwards, 1879) (Crust. Rég. Mex., p. 185)

Rathbun, 1925, p. 92, text-figs. 28–29, pl. 32, figs. 3–4, pl. 219, figs. 1–3; Rathbun, 1933, p. 10, fig. 7.

Range: Bahamas; Florida Straits; Dry Tortugas; west and northwest coasts of Florida; Puerto Rico; St. Thomas, Virgin Islands; Pará to Bahia, Brazil.

Depth: 13 to 85 m (7 to 47 fm).

Habitat: on hard surfaces, mainly coral; from calcareous algae and rock.

Remarks: Listed from off northwest Florida by Wass (1955). Coelho (1971c) extended the known depth range and commented on the ecology of this crab in Brazil. Also listed from Brazil by Coelho and Ramos (1972) and Fausto Filho (1974).

Anasimus A. Milne Edwards, 1880

Anasimus latus Rathbun, 1894 (Proc. U.S. Nat. Mus. 17: 58)

Rathbun, 1925, p. 65, pl. 214; Guinot-Dumortier, 1960, p. 177, fig. 18a–b; Williams, 1965, p. 240, figs. 217, 223F; Felder, 1973a, p. 49, pl. 7, fig. 5.

Range: North Carolina to south Florida; Florida Keys; northwest Florida to off coast of Tabasco, Mexico; west of Trinidad; Guianas; Amapá, Brazil.

Depth: 48 to 161 m (26 to 88 fm).

Habitat: mud, sand, broken shell, and coral bottoms.

Remarks: Rathbun (1925) compares differences in the morphology of adults and juveniles. Reports of ovigerous females were summarized by Williams (1965); females apparently carry eggs throughout the year in the Gulf of Mexico. Holthuis (1959) describes this species from off Surinam, where it is ovigerous from April to August. Sandifer and van Engel (1972) studied larval development under laboratory conditions. Regional lists include Florida (Wass, 1955), Mississippi (Franks *et al.*, 1972), Texas (Hildebrand, 1954; Leary, 1967), Mexico (Hildebrand, 1954), and the Gulf of Mexico collections of the R/V *Oregon* (Chace, 1956). Listed from Brazil by Coelho (1971c) and Coelho and Ramos (1972).

Anomalothir Miers, 1879

Anomalothir frontalis (A. Milne Edwards, 1879) (Crust. Rég. Mex., p. 189)

Rathbun, 1925, p. 25, pl. 8, fig. 1, pl. 9, fig. 1, pl. 207; Chace, 1940, p. 56.

Range: north coast of Cuba; Montserrat to Barbados.

Depth: 133 to 421 m (73 to 230 fm).

Habitat: sand, coral, and broken shell bottoms.

Remarks: Rathbun (1925) compares this species with *A. furcillatus*.

Anomalothir furcillatus (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 125)

Rathbun, 1925, p. 24, text-fig. 6, pl. 8, fig. 2, pl. 9, fig. 2, pl. 206; Rathbun, 1933, p. 6, fig. 2; Chace, 1940, p. 55; Williams, 1965, p. 236, figs. 212, 223A.

Range: North Carolina; Florida Straits and Keys; Dry Tortugas; off northwest

Florida; north coast of Cuba; north coast of Yucatan; Jamaica; St. Croix, Virgin Island to Grenada.

Depth: 55 to 686 m (30 to 375 fm), more commonly at depths of greater than 183 m (100 fm).

Habitat: mud, sand, shell, stone, and coral bottoms.

Remarks: Rathbun (1925) listed ovigerous females from the northeast quadrant of the Gulf in February and March.

Arachnopsis Stimpson, 1871

Arachnopsis filipes Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 121) ,

Rathbun, 1925, p. 89, text-figs. 26–27, pl. 32, figs. 1–2, pl. 219, figs. 4–5; Williams, McCloskey & Gray, 1968, p. 58.

Range: off North Carolina; Florida Straits; Dry Tortugas; west coast of Florida; off Dominica; Barbados; Ceará to Rio Grande do Norte, Brazil.

Depth: 27 to 238 m (15 to 130 fm).

Habit: sand, shell, and coral bottoms.

Remarks: Listed by Wass (1955) from northwest Florida and by Chace (1956) from R/V *Oregon* collections in the Gulf of Mexico. Recorded from Brazil by Coelho (1971a, 1971b) and Coelho and Ramos (1972).

Batrachonotus Stimpson, 1871

Batrachonotus fragosus Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 122)

Rathbun, 1925, p. 123, text-fig. 48, pl. 39, figs. 1–4; Rathbun, 1933, p. 13, fig. 10; Williams, 1965, p. 238, figs. 214, 223C.

Range: North Carolina; south, west and northwest coasts of Florida; Dry Tortugas; north coast of Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; Curaçao, Netherlands Antilles; Rio de Janeiro, Brazil.

Depth: shore to 137 m (to 75 fm).

Habitat: sand, shell and coral bottoms; rarely on mud.

Remarks: Listed from northwest Florida by Wass (1955), Hulings (1961), and Abele (1970). Williams (1965) reported ovigerous females from Dry Tortugas in June.

Collodes Stimpson, 1860

Collodes armatus Rathbun, 1898 (Bull. Lab. Nat. Hist. State Univ. Iowa 4: 252)

Rathbun, 1925, p. 122, pl. 217, fig. 6.

Range: off Havana, Cuba.

Remarks: known only from the type specimen, collected in 1893.

Collodes leptocheles Rathbun, 1894 (Proc. U.S. Nat. Mus. 17: 53)

Rathbun, 1925, p. 117, text-fig. 42, pl. 38, figs. 5–6; Pequegnat, 1970, p. 181; Felder, 1973a, p. 49, pl. 7, fig. 3.

Range: all quadrants of Gulf of Mexico except southeast, off coasts of Florida, Alabama, and Texas; off Vera Cruz, Mexico.

Depth: 124 to 384 m (68 to 210 fm).

Habitat: gray mud, broken shell substrates.

Remarks: Chace (1956) reported the first record of this species from off Texas, taken at 150 fm, and Leary (1967) also lists this crab from Texas. Pequegnat (1970) reported two ovigerous females, taken in August from 111 fm.

Collodes trispinosus Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 120)

Rathbun, 1925, p. 107, text-fig. 32, pl. 36, figs. 5–6; Williams, 1965, p. 239, figs. 215, 223D.

Range: North Carolina to south Florida; Florida Straits and Keys; Dry Tortugas; west and northwest coasts of Florida.

Depth: 7 to 150 m (4 to 82 fm).

Habitat: sand, broken shell, and gravel substrates.

Remarks: Listed from northwest Florida by Wass (1955). Williams (1965) lists ovigerous females from North Carolina in October and from Florida in July.

Euprognatha Stimpson, 1871

Euprognatha gracilipes A. Milne Edwards, 1878 (Crust. Rég. Mex., p. 184)

Rathbun, 1925, p. 101, pl. 34, figs. 3–4; Rathbun, 1933, p. 11.

Range: Florida Keys; north coast of Yucatan; off north coast of Cuba; Puerto Rico; St. Croix, Virgin Islands; Barbados; Amapá to São Paulo, Brazil.

Depth: 72 to 368 m (39 to 201 fm).

Habitat: sand, shell, coral, and rocky bottoms.

Remarks: Rathbun (1925) comments on variation within this species and the possibility of two different subspecies within the described population. Listed from Brazil by Coelho (1971c) and Coelho and Ramos (1972).

Euprognatha rastellifera acuta A. Milne Edwards, 1880 (Crust. Rég. Mex., p. 348)

Rathbun, 1925, p. 96, pl. 34, figs. 1–2; Rathbun, 1933, p. 11, fig. 8; Chace, 1940, p. 57.

Range: Massachusetts; North and South Carolina; Florida Keys; north coast of Cuba; Puerto Rico; St. Kitts; Martinique.

Depth: 102 to 708 m (56 to 387 fm).

Habitat: sand, coral, and shell substrates.

Remarks: There is considerable geographical overlap among the three forms of this species, the typical form, *E. r. acuta*, and *E. r. marthae*. The subspecies *acuta* is distributed over the entire species range, although it is more common in the southern portion, whereas *marthae* is listed by Rathbun (1925) as restricted to north of southern Florida, along the Atlantic coast. Williams (1965) notes the need for clarification of these forms and their distributions.

Inachoides H. Milne Edwards & Lucas, 1843

Inachoides forceps A. Milne Edwards, 1879 (Crust. Rég. Mex., p. 199)

As ***I. laevis***—Rathbun, 1925, p. 61 (part), text-fig. 17, not pl. 22, figs. 3–6; Rathbun, 1933, p. 8, fig. 4.

As ***I. forceps***—Garth, 1958, p. 101; Williams, McCloskey & Gray, 1968, p. 60, fig. 14.

Range: North Carolina; west and northwest coasts of Florida; Jamaica; Puerto Rico; Guadeloupe; St. Thomas, Virgin Islands; Guianas to Santa Catarina, Brazil.

Depth: shallow water to 38 m (to 21 fm).

Habitat: sand, gravel, and coral substrates.

Remarks: Garth (1958) separated the Pacific and Atlantic populations, previously combined as *I. laevis*, into two distinct species, retaining *laevis* for the original Pacific form designated by Stimpson. Williams, McCloskey and Gray (1968) cite pl. 22 of Rathbun (1925) as a synonymy, but this is of a specimen from the Pacific coast of Panama and it should be referred to *I. laevis*. Listed from northwest Florida by Wass (1955) and Menzel (1971) and from Brazil by Coelho (1971c) and Coelho and Ramos (1972).

Inachoides laevis Stimpson, 1860.

Restricted to Pacific records by Garth (1958); all Atlantic records are referred to *I. forceps* A. Milne Edwards.

Metoporhaphis Stimpson, 1860

Metoporhaphis calcarata (Say, 1818) (J. Acad. Nat. Sci. Philadelphia 1: 455)

Hay & Shore, 1918, p. 454, pl. 37, fig. 5; Rathbun, 1925, p. 21, text-fig. 5, pls. 6–7; Williams, 1965, p. 243, figs. 221, 223J; Felder, 1973a, p. 48, pl. 7, fig. 2.

Range: North Carolina to south Florida; Florida Keys; west coast of Florida to south Texas; Rio de Janeiro, Brazil.

Depth: shallow water to 90 m (to 49 fm).

Habitat: primarily hard surfaces, common on sand; rock, coral and grassy areas; among hydroids at North Carolina (Williams, 1965) and oyster beds at Grand Isle, Louisiana (Behre, 1950).

Remarks: Regional lists include Florida (Wass, 1955; Tabb and Manning, 1961; Dragovich and Kelly, 1964; Abele, 1970; Lyons *et al.*, 1971; Menzel, 1971), Mississippi (Richmond, 1968), Louisiana (Behre, 1950), and Texas (Breuer, 1962). Ovigerous females are known from South Carolina in August (Williams, 1965) and from Florida in March and August (Wass, 1955). Abele (1970) noted sexual dimorphism in the shape of the chelae. Wass (1955) commented on the ability of this crab to remain suspended in water by the rhythmic waving of the elongate legs, which are covered with fine setae on the distal portion. Listed from Brazil by Coelho and Ramos (1972).

Podochela Stimpson, 1860

Podochela curvirostris (A. Milne Edwards, 1879) (Crust. Rég. Mex., p. 196)

Rathbun, 1925, p. 50, pls. 19, 210; Chace, 1940, p. 56.

Range: Florida Straits; north coast of Cuba; Caribbean coast of Yucatan; Montserrat; Barbados; Grenadines.

Depth: 133 to 384 m (73 to 210 fm).

Habitat: coral, sand, and broken shell bottoms.

Remarks: Rathbun (1925) reported an ovigerous female from off Cuba in May.

Podochela gracilipes Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 126)

Hay & Shore, 1918, p. 454, pl. 37, fig. 6; Rathbun, 1925, p. 47, text-fig. 12, pl. 17; Williams, 1965, p. 243, figs. 220, 223I.

Range: North and South Carolina; Florida Keys and Straits; Dry Tortugas; west coast of Florida to off Alabama; north coast of Yucatan; Barbados; Colombia (Carib.); Guianas to Santa Catarina, Brazil.

Depth: 6 to 220 m (3 to 120 fm).

Habitat: sand, gravel, broken shell, rocky, and coral bottoms.

Remarks: Ovigerous females are known from North Carolina in December (Williams, 1965) and from Florida in March (Rathbun, 1925. Listed from shallow waters in Brazil by Coelho and Ramos (1972).

Podochela lamelligera (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 126)

Rathbun, 1925, p. 52, pl. 20, figs. 1–2.

Range: southeast Florida; off Key West, Florida; off northwest Florida.

Depth: 38 to 110 m (21 to 60 fm).

Habitat: sand, coral, and rocky substrates.

Remarks: Rathbun (1925) reports an ovigerous female from off Cape Florida in March. Listed by Chace (1956) from the Gulf of Mexico collections of the R/V *Oregon.*

Podochela macrodera Stimpson, 1860 (Ann. Lyc. Nat. Hist. New York 7: 196)

Rathbun, 1925, p. 44, text-fig. 11, pl. 16; Rathbun, 1933, p. 8.

Range: Bahamas; Florida Keys; west coast of Florida; off Caribbean coast of Yucatan; Cuba; Puerto Rico; Virgin Islands; Guadalupe; Curaçao, Netherlands Antilles; Brazil.

Depth: shallow water to 53 m (to 29 fm), rare to 91 m (50 fm).

Habitat: coral, sand, and gravel bottoms; from sponges; among rocks.

Remarks: Rathbun (1925) listed ovigerous females from off Florida in February and from Cuba in June. Coelho (1971c) listed this crab from depths of 20 to 53 m off Brazil.

Podochela riisei Stimpson, 1860 (Ann. Lyc. Nat. Hist. New York 7: 196)

Hay & Shore, 1918, p. 453, pl. 37, fig. 9; Rathbun, 1925, p. 33, text-fig. 9, pl. 11, figs. 1–2, pl. 208, fig. 2; Rathbun, 1933, p. 7, fig. 3; Chace, 1940, p. 56; Williams, 1965, p. 241, figs. 218, 223G.

Range: North Carolina; Bermuda; Bahamas; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; Campeche, off Yucatan; Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; Rio de Janeiro and south of Pernambuco, Brazil.

Depth: shallow water to 90 m (to 49 fm).

Habitat: coral, sand, shell, rock, and gravel substrates; on alga beds, grasses on sand bottoms; among *Sargassum* (Wass, 1955).

Remarks: Records of ovigerous females include the west coast of Florida in March, April, June and September (Lyons *et al.*, 1971) and from November through February (Rathbun, 1925). These crabs are often covered with a number of other organisms, including actinians, sponges, and rhizocephalan barnacles (Rathbun, 1925), and bryozoans, ascidians, and a red algae, *Calathamnion byssoideum*, as reported by Wass (1955). Regional lists include Florida (Wass, 1955; Tabb and Manning, 1961; Dragovich and Kelly, 1964; Abele, 1970; Lyons *et al.*, 1971; Menzel, 1971), Campeche (Hildebrand, 1955), and the Gulf of Mexico (Chace, 1956). Coelho (1971c) listed it from depths of 24 to 90 m, off Brazil.

Podochela sidneyi Rathbun, 1924 (Proc. U.S. Nat. Mus. 64: 1)

Rathbun, 1925, p. 39, pls. 12–13; Williams, 1965, p. 242, figs. 219, 223H; Felder, 1973a, p. 49,, pl. 7, fig. 4.

Range: North Carolina; Dry Tortugas; west coast of Florida to central Texas coast; off north coast of Yucatan; northwest coast of Cuba.

Depth: shallow water to 187 m (to 102 fm).

Habitat: mud, broken shell, sand, coral, and rock bottoms; on alga-covered surfaces.

Remarks: Hildebrand (1954) collected specimens off Louisiana and Texas with small *Styela* (ascidians) attached to the legs, and some were covered with a dense hydroid growth. Listed from Florida by Wass (1955), Abele (1970), and Menzel (1971) and from Texas by Hildebrand (1954) and Leary (1967).

Pyromaia Stimpson, 1871

Pyromaia arachna Rathbun, 1924 (Proc. U.S. Nat. Mus. 64: 1)

Rathbun, 1925, p. 131, pls. 42–43; Pequegnat, 1970, p. 182.

Range: off South Carolina; off west coast of Florida to off east coast of Mexico; throughout all quadrants of the Gulf of Mexico.

Depth: 183 to 384 m (100 to 210 fm).

Habitat: off mud, mud-sand, and mud-shell bottoms.

Remarks: Rathbun (1925) reports ovigerous females off Florida in March. Listed from the Gulf collections of the R/V *Oregon* by Chace (1956) and from Texas by Leary (1967).

Pyromaia cuspidata Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 110)

Hay & Shore, 1918, p. 455, pl. 38, fig. 4; Rathbun, 1925, p. 129, text-fig. 49, pl. 41; Chace, 1940, p. 57; Williams, 1965, p. 240, figs. 216, 223E; Pequegnat, 1970, p. 181.

Range: North Carolina; south Florida; Florida Keys and Straits; Dry Tortugas; west coast of Florida; off Caribbean coast of Yucatan; north and south coasts of Cuba.

Depth: 27 to 549 m (15 to 300 fm).

Habitat: mud, sand, rock, coral, and pebble substrates.

Remarks: Chace (1940) noted that this crab autotomizes its legs readily. Williams (1965) reports ovigerous females from off Florida in February and July.

Stenorhynchus Lamarck, 1818

Stenorhynchus seticornis (Herbst, 1788) (Versuch Naturgesch. Krabben u. Krebse, vol. 1, p. 229)

Common Names: Arrow Crab; Araña del Mar

Hay & Shore, 1918, p. 455, pl. 37, fig. 8; Rathbun, 1925, p. 13, text-fig. 3, pls. 2–3; Rathbun, 1933, p. 6, fig. 1; Chace, 1940, p. 55; Williams, 1965, p. 244, figs. 222, 223K; Felder, 1973a, p. 48, pl. 7, fig. 1; Pequegnat & Ray, 1974, p .237, figs. 11–12; Yang, 1976, p. 157.

Range: North Carolina to south Florida; Bermuda; Bahamas; Florida Keys and Straits; Dry Tortugas; west coast of Florida to south Texas; north and east coasts of Yucatan; north and south coasts of Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands to Dominica; Netherlands Antilles; Colombia; Maranhão to Santa Catarina, Brazil.

Depth: near surface to 1489 m (814 fm).

Habitat: rock, coral, sand, sand-shell, and pebble bottoms; from sponges; off wharf pilings and rock jetties.

Remarks: The eastern Atlantic records cited by Rathbun (1925) are referred to *S. lanceolatus* (Brullé) by Yang (1967) and Barr (1975). Yang (1976) provides evidence that *S. seticornis* contains two species, one in shallow water, the other a deep water form. Williams (1965) states that this crab is more commonly collected at depths of 100 fm or less. Various authors use a variation of the genus name (e.g., *Stenorynchus*, in Williams, 1965). Yang (1967) describes larval stages. Ovigerous females occur off Texas in May and June (Hildebrand, 1954) and throughout the spring and summer over most of its range. Regional lists include Florida (Wass, 1955; Menzel, 1971), Mississippi (Franks *et al.*, 1972), Texas (Hildebrand, 1954; Leary, 1967), and the mid-ocean Gulf (Chace, 1956). Hartnoll (1965a) provided some notes on the biology and growth of Jamaican populations and Barr (1971, 1975) studied its biology in the Virgin Islands. Its occurrence in Brazil was noted by Coelho (1971c) and Coelho and Ramos (1972). Agonistic behavior of this crab is discussed by Schone (1968) and antennule chemosensitivity was tested by Hazlett (1971). Herrnkind, Stanton and Conklin (1976) described commensal relationships with an anemone in Florida.

Subfamily MAJINAE Samouelle, 1819

Temnonotus A. Milne Edwards, 1875

Temnonotus granulosus A. Milne Edwards, 1875 (Crust. Rég. Mex., p. 83)

As ***T. simplex***—Rathbun, 1925, p. 342, pl. 249, figs. 10–12.
As ***T. granulosus***—Rathbun, 1925, p. 341, pl. 249, figs. 7–9; Chace, 1940, p. 65, fig. 22.

Range: north coast of Cuba; Barbados.

Depth: 183 to 478 m (100 to 260 fm).

Habitat: coral, broken shell bottoms.

Remarks: Rathbun (1925) commented on the likelihood that the female type of *T. granulosus* was conspecific with the males of *T. simplex*, the only known specimens of these two species. Chace (1940) synonymized the two names on the basis of a male *T. granulosus* taken off Cuba. He also noted that distinctions in individual specimens are attributable to age variation as well as sexual dimorphism.

Temnonotus simplex A. Milne Edwards, 1875

Synonym of *T. granulosus* A. Milne Edwards, as revised by Chace (1940).

Subfamily MITHRACINAE Balss, 1929 (sensu Garth, 1958).

(This subfamily consists of Mithracinae Balss, 1929 plus Macrocoelominae Balss, 1929, derived from the Majinae Periceroida of Alcock, 1895. Glaessner treats the genera of this group under the subfamily Majinae Samouelle, 1819.)

Coelocerus A. Milne Edwards, 1875

Coelocerus spinosus A. Milne Edwards, 1875 (Crust. Rég. Mex., p. 85)

Rathbun, 1925, p. 446, text-fig. 130, pl. 263, pl. 264, figs. 1–2; Felder, 1973a, p. 49, pl. 7, fig. 6.

Range: west coast of Florida to off Alabama.
Depth: 24 to 64 m (13 to 35 fm).
Habitat: rock, coral, and sand bottoms.

Remarks: Garth (1958) states that this genus may be a link between *Libinia* and *Neodoclea* of the Pisinae and *Stenocionops* and *Macrocoeloma* of the Mithracinae.

Hemus A. Milne Edwards, 1875

Hemus cristulipes A. Milne Edwards, 1875 (Crust. Rég. Mex., p. 88)

Rathbun, 1925, p. 345, text-fig. 110, pl. 124, fig. 1, pl. 248, figs. 9–15; Rathbun, 1933, p. 21, fig. 23.

Range: northwest coast of Florida; north coast of Yucatan; Puerto Rico; Curaçao, Netherlands Antilles, Maranhão to Pernambuco, Brazil.
Depth 15 to 69 m (8 to 38 fm).
Habitat: sand, rock, and coral bottoms; in horn sponges and in the coral *Porites porites*.

Remarks: Listed by Wass (1955) and Menzel (1971) from northwest Florida. Brazilian listings include Coelho (1971c), Coelho and Ramos (1972), and Fausto Filho (1974).

Macrocoeloma Miers, 1879

Macrocoeloma camptocerum (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 112)

Hay & Shore, 1918, p. 457, pl. 38, fig. 12; Rathbun, 1925, p .469, pl. 174, fig. 4, pl. 270, fig. 2; Williams, 1965, p. 264, figs. 244, 245K.

Range: North Carolina; southeast Florida; Florida Keys; south Florida to northwest Florida.

Depth: 4 to 35 m (2 to 19 fm).

Habitat: rock, sand, coral, and broken shell substrates; often from grassy areas.

Remarks: Rathbun (1925) reported specimens covered with various sponges, hydroids, bryozoans, ascidians, and infestations of rhizocephalid barnacles. Ovigerous females were listed from North Carolina in August and from Florida in January to March. Wass (1955) and Menzel (1971) list this species from northwest Florida and Lyons *et al.* (1971) state that it is ovigerous in April, June, and October at Crystal River, Florida.

Macrocoeloma diplacanthum (Stimpson, 1860) (Ann. Lyc. Nat. Hist. New York 7: 183)

Rathbun, 1925, p. 478, pl. 169, fig. 1, pl. 269, figs. 1–3; Rathbun, 1933, p. 36.

Range: Bahamas; Key West, Florida; Cuba; Jamaica; Puerto Rico; Virgin Islands; Guadeloupe; Curaçao, Netherlands Antilles; Old Providence Island (Carib.).

Depth: 5 to 24 m (3 to 13 fm).

Habitat: off shallow reefs; sandy substrates.

Remarks: Rathbun (1925) listed specimens infected with rhizocephalid barnacles and others that were encrusted with algae.

Macrocoeloma eutheca (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 112)

Rathbun, 1925, p. 484, text-fig. 137, pl. 170, fig. 1, pl. 171, fig. 1; Rathbun, 1933, p. 37.

Range: Bahamas; southeast Florida; Florida Keys; north coast of Cuba; St. Croix, Virgin Islands; Barbados; Caribbean coast of Panama; Maranhão to Bahia, Brazil.

Depth: 30 to 214 m (16 to 117 fm).

Habitat: rock, broken shell, and coral substrates.

Remarks: Chace (1956) listed this crab from the R/V *Oregon* collections in the Gulf of Mexico. Listings from Brazil include Coelho (1971a, 1971c) and Coelho and Ramos (1972).

Macrocoeloma intermedium Rathbun, 1901 (Bull. U.S. Fish. Comm. 20: 75)

Rathbun, 1925, p. 486, text-fig. 138, pl. 170, fig. 2, pl. 171, fig. 2.

Range: north coast of Cuba; Dominica; Caribbean coast of Panama.

Depth: 62 to 298 m (34 to 163 fm).

Habitat: coral and broken shell bottoms.

Macrocoeloma laevigatum (Stimpson, 1860) (Ann. Lyc. Nat. Hist. New York 7:181)

Rathbun, 1925, p. 483, text-fig. 136, pl. 169, figs. 2–3; Rathbun, 1933, p. 36.

Range: Florida Keys; north coast of Cuba; Jamaica; St. Thomas, Virgin Islands; Guadeloupe; Piauí to Alagoas, Brazil.

Depth: shore to 31 m (to 17 fm).

Habitat: rock and sand bottoms, often weedy.

Remarks: Listed from Brazil by Coelho (1971a, 1971c) and Coelho and Ramos (1972).

Macrocoeloma septemspinosum (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 113)

Rathbun, 1925, p. 477, pl. 173, figs. 2–3.

Range: South Carolina; Bahamas; Florida Keys; northeast quadrant of Gulf; Ceará to Rio Grande do Norte, Brazil.

Depth: shallow water to 145 m (to 79 fm), rarely to 212 m (116 fm).

Habitat: sand, broken shell, and coral substrates; on calcareous algae.

Remarks: Listed by Chace (1956) from the Gulf of Mexico. Brazilian records include Coelho (1971a, 1971c) and Coelho and Ramos (1972).

Macrocoeloma subparallelum (Stimpson, 1860) (Ann. Lyc. Nat. Hist. New York 7: 182)

Rathbun, 1925, p. 480, pl. 172; Rathbun, 1933, p. 36.

Range: north coast of Cuba; Jamaica; Haiti; Puerto Rico; St. Thomas, Virgin Islands; Guadeloupe; Barbados; Old Providence Island (Carib.); Rio Grande do Norte to Pernambuco, Brazil.

Depth: shallow water to 22 m (to 12 fm).

Habitat: on coral reefs; in tide pools; on bottoms of sand, grasses and weeds.

Remarks: Brazilian records include notes on its occurrence in the littoral zone (Coelho, 1971c) and listings by Coelho and Ramos (1972) and Fausto Filho (1974).

Macrocoeloma trispinosum trispinosum (Latreille, 1825) (Encyc. meth., Hist. Nat., vol 10, p. 142)

Common Names: Grass Crab; Sponge Crab; Decorator Crab

Hay & Shore, 1918, p. 457, pl. 38, fig. 11; Rathbun, 1925, p. 466, text-fig. 132, pl. 166, fig. 1, pl. 167; Rathbun, 1933, p. 35, fig. 31; Williams, 1965, p. 263, fig. 243; Felder, 1973a, p. 53, pl. 7, fig. 9.

Range: North Carolina; Bermuda; south Florida to northwest Florida; off Louisiana and Texas; Gulf and Caribbean coasts of Yucatan, Mexico; Cuba; Jamaica; Puerto Rico; St. Thomas to St. Lucia; Curaçao, Netherlands Antilles; Piauí to Bahia, Brazil.

Depth: shallow water to 82 m (to 45 fm).

Habitat: sand, rock and shell bottoms; among submerged mangrove roots; from wharf pilings; from floating masses of *Sargassum*.

Remarks: Rathbun (1925) listed three varieties of this species, two of which are listed here as subspecies (the typical form and *M. t. nodipes*), and a third, considered an intermediate form. Behre (1950) listed an unspecified form of *Macrocoeloma* from Louisiana and Menzel (1971) and Lyons *et al.* (1971) record this crab as uncommon in Florida. Ovigerous female records were summarized by Williams (1965). Hartnoll (1965a) described the biology and growth of this crab in Jamaica. Many specimens are encrusted with sponges, which are

attached to the hairs of the carapace and legs, providing the basis for two of its common names. Records from Brazil include Coelho (1971a, 1971c), Coelho and Ramos (1972) and Fausto Filho (1974).

Macrocoeloma trispinosum nodipes (Desbonne, 1867) (Crust. de la Guadeloupe, p. 15)

Rathbun, 1925, p. 468, pl. 166, fig. 2, pl. 168, fig. 2; Rathbun, 1933, p. 36; Williams, 1965, p. 264.

Range: North Carolina; Bermuda; south to northwest coasts of Florida; Florida Keys and Dry Tortugas; Cuba; Puerto Rico; Antigua; Brazil.

Depth: shore to 48 m (to 26 fm).

Habitat: sand, shell, rock, and coral bottoms; grassy areas.

Remarks: Rathbun (1925) lists several specimens that were covered with sponges and one crab that was encrusted with worm tubes. She reported ovigerous females from Florida in December and from Cuba in June. Listed from Florida by Wass (1955), Abele (1970), and Menzel (1971), and from the Gulf collections of the R/V *Oregon* by Chace (1956). Abele (1970) treats this form as a separate species and notes the need for revision of this genus.

Macrocoeloma trispinosum variety Rathbun, 1925 (Bull. U.S. Nat. Mus. 129: 468)

Rathbun, 1925, p. 468, pl. 168, fig. 1; Rathbun, 1933, p. 36.

Range: North Carolina; Bahamas; southeast and west coasts of Florida; Florida Keys and Dry Tortugas; Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; Curaçao, Netherlands Antilles.

Depth: low tide mark to 51 m (to 28 fm).

Habitat: sand, shell, rock, and coral bottoms.

Remarks: Williams (1965) followed the practice of Rathbun (1925) in treating this variety as an unnamed but distinct form, an intermediate linking the typical subspecies and *M. t. nodipes*. If the latter is raised to the status of a full species (as in Abele, 1970), then this variety will require reevaluation as a subspecies or species.

Microphrys H. Milne Edwards, 1851

Microphrys antillensis Rathbun, 1920 (Proc. Washington Acad. Sci. 33: 24)

As ***M. platysoma***—Hay & Shore, 1918, p. 459, pl. 38, fig. 9.
As ***M. antillensis***—Rathbun, 1925, p. 498, text-fig. 141, pl. 176, figs. 3, 4; Rathbun, 1933, p. 38; Williams, 1965, p. 260, figs. 240, 245G.

Range: North Carolina; Bimini; west coast of Florida; north coast of Cuba; Jamaica; Puerto Rico; Brazil.

Depth: 4 to 38 m (2 to 21 fm).

Habitat: mud, coral, sand, shell, and weed bottoms.

Remarks: Ovigerous females were reported from North Carolina in September (Rathbun, 1925) and from Florida in June and from Bimini in November (Williams, 1965). Listed from Brazil by Coelho (1971c) and Coelho and Ramos (1972).

Microphrys bicornutus (Latreille, 1825) (Encyc. meth., Hist. Nat. Insectes, vol. 10, p. 141)

Common Name: Dirty Decorator Crab

Hay & Shore, 1918, p. 459, pl. 38, fig. 10; Rathbun, 1925, p. 489, text-fig. 139, pl. 175; Rathbun, 1933, p. 37, fig. 32; Williams, 1965, p. 259, figs. 239, 245F.

Range: North Carolina to south Florida; Bermuda; Bahamas; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; north coast of Cuba; Jamaica; Puerto Rico; St. Thomas to Barbados; Old Providence Island in the Caribbean Sea; Caribbean coast of Panama to Venezuela; Curaçao; Trinidad; Island of Santa Anna to Santa Catarina, Brazil.

Depth: shallow water to 30 m (to 16.5 fm).

Habitat: common on coral reefs; on a variety of substrates, including rock, shell, sand, and mud; among grass, mangrove roots, and on sponges; often covered with anemones, algae, sponges, etc.

Remarks: Rathbun (1925) notes that Latreille's original type locality, "Nouvelle Hollande," is an error. Ovigerous females occur from March to August in the Caribbean and from November to January in the West Indies, Brazil, and Venezuela (Williams, 1965). Wass (1955) and Menzel (1971) list this species as rare in northwest Florida. Listed from Brazil by Coelho (1971a), Coelho and Ramos (1972), and Fausto Filho (1974). Hartnoll (1965a) commented on the biology and growth of this crab in Jamaica and Coelho (1971c) provided ecological notes on Brazilian specimens. Zoeal stages have been described by Lebour (1944) and by Hartnoll (1964b). Hazlett (1972a, 1972b) and Hazlett and Estabrook (1974) analyzed agonistic behavior and Hazlett (1971) tested the antennular chemosensitivity of this species. Williams (1965) lists records of copepods and a tapeworm from this crab.

Microphrys platysoma (Rathbun, 1901), not (Stimpson, 1860).

Specimens from Puerto Rico were designated by Rathbun (1920) as *M. antillensis*, to which all of the Atlantic specimens are referred, separating them from the Pacific form of Stimpson.

Mithrax Desmarest, 1823

(Although Latreille, 1817 had been traditionally recognized as the author of this genus, Garth (1958) questioned the validity of Latreille's citation and attributes the first valid citation to Desmarest.)

Subgenus ***Mithraculus*** White, 1847

Mithrax (Mithraculus) cinctimanus (Stimpson, 1860) (Amer. J. Sci. 29: 132)

Rathbun, 1925, p. 438, pl. 158; Rathbun, 1933, p. 32.

Range: Bahamas; southeast Florida; Florida Keys and Dry Tortugas; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; St. Martin; Antigua; Curaçao.

Depth: shallow water.

Habitat: on coral reefs; rocky bottoms; inside sponges.

Mithrax (Mithraculus) coryphe (Herbst, 1801) (Natur. Krabben u. Krebse, vol. 3, pt. 2, p. 8)

Rathbun, 1925, p. 426, pl. 153; Rathbun, 1933, p. 31.

Range: Bahamas; southeast Florida; Florida Keys; north coast of Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands to Barbados; Caribbean coast of Panama to Colombia; Curaçao; Trinidad; Ceará and Fernando de Noronha to São Paulo, Brazil.

Depth: shallow water to 55 m (to 30 fm).

Habitat: in cavities of corals, rocks, and sponges; on sand, broken shell, grass, and mud bottoms.

Remarks: Listed from Brazil by Coelho and Ramos (1972).

Mithrax (Mithraculus) forceps (A. Milne Edwards, 1875) (Crust. Rég. Mex., p. 109)

Hay & Shore, 1918, p. 457, pl. 38, fig. 1; Rathbun, 1925, p. 431, pl. 156; Rathbun, 1933, p. 32; Chace, 1940, p. 67; Williams, 1965, p. 258, figs. 238, 245E; Pequegnat & Ray, 1974, p. 236, figs. 1–4.

Range: Bermuda; North Carolina to south Florida; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; West Flower Garden Bank, off Texas; south coast of Cuba; Puerto Rico; St. Thomas, Virgin Islands; Barbados; Old Providence Island (Carib.); Netherlands Antilles; Venezuela; Trinidad; Ceará to Rio de Janeiro, Brazil.

Depth: intertidal to 90 m (to 49 fm).

Habitat: under stones and dead coral; in crevices along rocky shores and reefs; in sponges; on sand, shell, coral, rock, and grass bottoms.

Remarks: Ovigerous females have been reported from Florida in November to February, from the Gulf of Mexico in February, and from the southern Caribbean in April, mid-summer, September, and November (Williams, 1965). Listed from northwest Florida by Wass (1955), Abele (1970), and Menzel (1971). Chace (1956) recorded this crab from the Gulf of Mexico collections of the R/V *Oregon* and Pequegnat and Ray (1974) state that this species is one of the most common brachyurans on the West Flower Garden reefs, often taken on sponges. Williams (1965) reports this crab from the sponge, *Stematumenia strobilinia*, off North Carolina. Lebour (1944) described some of the larval stages. Threat behavior was described and illustrated by Schone (1968). Listed from Brazil by Coelho (1971a, 1971c), Coelho and Ramos (1972) and Fausto Filho (1974).

Mithrax (Mithraculus) ruber (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 118)

Rathbun, 1925, p. 432, pl. 157; Rathbun, 1933, p. 32.

Range: north coast of Cuba; Puerto Rico; St. Thomas, Virgin Islands to Barbados; Curaçao.

Depth: shallow water to 46 m (to 25 fm), rare to 154 m (84 fm).

Habitat: sand, shell, grass, coral, and mud substrates; off coral reefs; in sponges.

Mithrax (Mithraculus) sculptus (Lamarck, 1818) (Hist. Anim. sans Vert., vol. 5, p. 242)

Rathbun, 1925, p. 422, text-figs. 125–126, pl. 152; Rathbun, 1933, p. 31.

Range: Bahamas; southeast Florida; Florida Keys and Dry Tortugas; north coast of Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; Antigua; Barbados; Swan Island and Old Providence Island (Carib.); Belize; Curaçao; Rio Grande do Norte to Bahia, Brazil.

Depth: shallow water to 55 m (to 30 fm).

Habitat: abundant on coral reefs; under stones at low tide; on sand, shell, grass, and mud bottoms.

Remarks: Hartnoll (1965a) provides data on the biology and growth of this crab in Jamaica. Listed from Brazil by Coelho and Ramos (1972) and by Fausto Filho (1974).

Subgenus ***Mithrax*** Desmarest, 1823

Mithrax (Mithrax) acuticornis Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 116)

Rathbun, 1925, p. 388, pl. 136, figs. 1–2, pl. 257, fig. 1; Rathbun, 1933, p. 29, fig. 28; Felder, 1973a, p. 52, pl. 7, fig. 10.

Range: southeast coast of Florida; Florida Keys and Straits; Dry Tortugas; west and northwest coasts of Florida; off Texas; north and east coasts of Yucatan, Mexico; Puerto Rico; Santa Cruz to Grenadines in the Lesser Antilles; Amapá to Espirito Santo, Brazil.

Depth: 11 to 103 m (6 to 56 fm).

Habitat: sand, mud, broken shell, rock, and coral substrates.

Remarks: Rathbun (1925) compared this species with the young of *M. cornutus* and *M. spinosissimus*, with which it can be confused. Felder (1973a) provided the first northwestern Gulf of Mexico records, based on specimens collected off Galveston and Port Mansfield, Texas. Listed from Brazil by Coelho (1971a, 1971c) and Coelho and Ramos (1972).

Mithrax (Mithrax) cornutus Saussure, 1857 (Rev. Mag. Zool., ser. 2, 9: 501)

Common Names: Coral Crab; Red Spider Crab

Rathbun, 1925, p. 386, pl. 137, figs. 3–4, pl. 256.

Range: Bermuda; Florida Straits; north coast of Cuba; between Jamaica and Haiti; Dominica; Martinique; off Bahia, Brazil.

Depth: shallow water to 1077 m (589 fm).

Habitat: coral, sand, and broken shell bottoms.

Remarks: Listed by Chace (1956) from the Gulf of Mexico.

Mithrax (Mithrax) hispidus (Herbst, 1790) (Natur. Krabben u. Krebse, vol. 1, p. 245 (not p. 247)).

Common Name: Coral Crab

Rathbun, 1925, p. 406, text-fig. 124, pls. 145–146, pl. 147, fig. 3; Rathbun, 1933, p. 30; Williams, 1965, p. 256, figs. 236, 245C; Pequegnat & Ray, 1974, p. 236, figs. 5–10.

Range: Delaware Bay to south Florida; Bermuda; Bahamas; Florida Keys and Dry Tortugas; West Flower Garden Bank, off Texas; Jamaica; Curaçao; Pará to São Paulo, Brazil.

Depth: shallow water to 65 m (36 fm).

Habitat: sand, shell, and stone bottoms; on coral reefs; inside sponges; occasionally on the sea grass, *Halodule*.

Remarks: Plentiful on the coral reefs of the West Flower Garden Bank (Pequegnat and Ray, 1974). Listed from Brazil by Coelho (1971a, 1971c) and by Coelho and Ramos (1972).

Mithrax (Mithrax) holderi Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 117)

Rathbun, 1925, p. 392, pl. 138, figs. 1–2, pl. 257, fig. 2; Rathbun, 1933, p. 29.

Range: Florida Keys and Dry Tortugas; north and south coasts of Cuba; Jamaica; Puerto Rico; Virgin Islands.

Depth: intertidal to 38 m (to 21 fm).

Habitat: coral bottoms.

Mithrax (Mithrax) pilosus Rathbun, 1892 (Proc. U.S. Nat. Mus. 15: 262)

Rathbun, 1925, p. 394, pl. 138, fig. 3, pl. 258; Rathbun, 1933, p. 29.

Range: Bahamas; Florida Keys and Dry Tortugas; Vera Cruz, Mexico; Cuba; Puerto Rico; St. Thomas, Virgin Islands to Barbados; Caribbean coast of Panama; Venezuela.

Depth: data not available.

Habitat: rare on stony bottoms; off reefs.

Mithrax (Mithrax) pleuracanthus Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 116)

As ***M. depressus***—Hay & Shore, 1918, p. 458, pl. 38, fig. 2.
As ***M. pleuracanthus***—Hay & Shore, 1918, p. 458, pl. 38, fig. 3; Rathbun, 1925, p. 411, pl. 150; Rathbun, 1933, p. 31; Williams, 1965, p. 257, figs. 237, 245D.

Range: Bermuda; North and South Carolina; southeast Florida; Florida Keys and Dry Tortugas; Bahamas; west and northwest coasts of Florida; north coast of Yucatan; north coast of Cuba; Puerto Rico; St. Thomas, Virgin Islands; St. Martin; Old Providence Island (Carib.); Curaçao; Venezuela.

Depth: shallow water to 51 m (to 28 fm).

Habitat: common on rocky, gravel, and broken shell substrates; occasionally on sand and mud bottoms; in the sponge *Stematumenia strobilinia* at Tortugas (Pearse, 1934). Often encrusted with bryozoans, serpulid worms, etc. (after Williams, 1965).

Remarks: Listed as common in northwest Florida by Wass (1955), Abele (1970), and Menzel (1971). Williams (1965) notes that this species is often associated with *Mithrax forceps* on the banks off North Carolina in April, from St. Thomas in July, and from Venezuela in September.

Mithrax (Mithrax) spinosissimus (Lamarck, 1818) (Hist. Nat. Anim. sans Vert., vol. 5, p. 241)

Common Names: Cangrejo de la Santa Virgen; Cabouca; Lazy Crab

Rathbun, 1925, p. 383, pl. 135; Rathbun, 1933, p. 29; Chace, 1940, p. 67; Williams, 1965, p. 254, figs. 234, 245A.

Range: North or South (?) Carolina; Florida Keys and Dry Tortugas; north and south coasts of Cuba; Jamaica; Haiti; Virgin Islands; Guadeloupe. Type locality of "Ile-de-France" is erroneous.

Depth: shallow water to 179 m (to 98 fm).

Habitat: among rocks and on coral sand bottoms; crab is often encrusted with stalked barnacles, bryozoans, serpulid worms, red foraminiferans, etc.

Remarks: Ovigerous females were reported from Cuba in May and June by Rathbun (1925). Hazlett and Rittschof (1975) reported on spatial patterns of activity. Brownell, Provenzano and Martinez (1977) reported on attempts to commercially culture this crab in Venezuela.

Mithrax (Mithrax) verrucosus H. Milne Edwards, 1832 (Mag. Zool., vol. 2, class 7, pl. 4)

Rathbun, 1925, p. 400, pl. 144; Rathbun, 1933, p. 30; Williams, 1965, p. 255, figs. 235, 245B.

Range: South Carolina; Bahamas; southeast Florida; Florida Keys and Dry Tortugas; north coast of Cuba; Swan Islands (Carib.) Jamaica; Hispaniola; Puerto Rico; St. Thomas, Virgin Islands; Guadeloupe; Curaçao; Martinique; Rocas and Fernando do Noronha, Brazil.

Depth: shallow water, near shore.

Habitat: among rocks; hides in crevices and holes; often found near madrepores; has nocturnal habits.

Remarks: Found in *Porites porites* at Curaçao. Pearse (1932b) determined the freezing point of hemolymph from this crab at Dry Tortugas. Listed from Brazil by Coelho (1971a, 1971c), Coelho and Ramos (1972) and by Fausto Filho (1974).

Stenocionops Desmarest, 1823

Stenocionops furcata furcata (Oliver, 1791) (Encyc. méth., Hist. Nat., Insects, vol. 6, p. 174)

Common Names: Decorator Crab; Macca Crab

Rathbun, 1925, p. 449, text-fig. 131, pls. 160–161; Rathbun, 1933, p. 33, fig. 30; Guinot-Dumortier, 1960, p. 180, fig. 21a–b.

Range: Georgia; Florida (location unspecified); ? Gulf of Mexico; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; Dominica; Barbados; French Guiana; Paraiba to Rio de Janeiro, Brazil; South Africa.

Depth: shallow water to 64 m (to 35 fm).

Habitat: mud, sand, coral, rock, and shell bottoms; on wharf pilings.

Remarks: The inclusion of this form in the Gulf fauna is doubtful. Although Leary (1967) and Felder (1973a) report this form from Texas, both reports are

based on a listing by Hildebrand (1954) in which the subspecies identification may have been in error. Felder (1973a) indicates that more recent collections in the northwestern Gulf are of crabs similar to *S. furcata coelata*, and other records confirm the presence of this latter form in the region. Neither of the two specimens cited by Rathbun (1925, p. 542) are determined for the Gulf. Guinot-Dumortier (1960) remarked that the male pleopod of this species is very similar to the pleopods of three Pacific species figured by Garth (1958). Listed from Brazil by Coelho and Ramos (1972).

Stenocionops furcata coelata (A. Milne Edwards, 1878) (Bull. Soc. Philom., ser. 7, 2:224)

Hay & Shore, 1918, p. 460, pl. 39, fig. 3; Rathbun, 1925, p. 450, pl. 164; Rathbun, 1933, p. 34; Williams, 1965, p. 261, figs. 241, 245H; Felder, 1973a, p. 53, pl. 7, fig. 12.

Range: North Carolina to south Florida; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; Alabama to Texas; north and east coasts of Yucatan; north coast of Cuba; Puerto Rico; St. Lucia; Barbados.

Depth: shallow water to 110 m (to 60 fm), rarely to 508 m (278 fm).

Habitat: sand, shell, and coral bottoms, usually of coarse material; on shelly reefs off North Carolina.

Remarks: Early Gulf records distinguishing this subspecies from the typical form may be confused (Felder, 1973a). A single specimen taken off St. Joseph Island, Texas (Hildebrand, 1954) is probably *coelata*; it was covered with algae, hydroids, bryozoans, three small *Ostrea*, and three large *Calliactis tricolor*. Listed from the Gulf of Mexico (Chace, 1956) and from northwest Florida (Wass, 1955; Hulings, 1961; Abele, 1970). Ovigerous females occur in Florida from March to August (Williams, 1965).

Stenocionops spinimana (Rathbun, 1892) (Proc. U.S. Nat. Mus. 15: 240)

Hay & Shore, 1918, p. 460, pl. 39, fig. 2; Rathbun, 1925, p. 457, pl. 267; Williams, 1965, p. 262, figs. 242, 245I; Pequegnat, 1970, p. 182.

Range: North and South Carolina; Florida Keys; west coast of Florida to off Mississippi.

Depth: 37 to 227 m (20 to 124 fm).

Habitat: mud, sand, shell, coral, and rock bottoms.

Remarks: Williams (1965) noted the age-related variability in the morphology of this and related species. Rathbun (1925) listed ovigerous females from South Carolina in December. Listed by Chace (1956) from the Gulf of Mexico and by Franks *et al.* (1972) off Mississippi at 37 to 91 m depth.

Stenocionops spinosissima (Saussure, 1857) (Rev. Mag. Zool., ser. 2, 9: 501)

Rathbun, 1925, p. 455, pl. 165, fig. 2, pl. 264, figs. 3–4, pl. 265; Chace, 1940, p. 67; Williams, McCloskey & Gray, 1968, p. 62; Pequegnat, 1970, p. 182; Felder, 1973a, p. 52, pl. 7, fig. 11.

Range: North Carolina; south and southwest Florida; off Texas and east coast of Mexico; north coast of Cuba; Haiti; Guadeloupe; Dominica; Rio de Janeiro and Fernando de Noronha, Brazil.

Depth: 46 to 480 m (25 to 260 fm); center of depth distribution in Gulf is at 110 to 183 m (60 to 100 fm) (Pequegnat, 1970).

Habitat: mud and sand bottoms.

Remarks: Hildebrand (1954) found this crab to be common off the Texas coast at depths of 25 to 37 fm (46 to 68 m) and he reported ovigerous females in February and April. Listed from Texas by Leary (1967) and from the Gulf of Mexico by Chace (1956). Recorded from Brazil by Coelho and Ramos (1972) and by Fausto Filho (1974).

Teleophrys Stimpson, 1860

Teleophrys ornatus Rathbun, 1901 (Bull. U.S. Fish. Comm. 20: 65)

Rathbun, 1925, p. 444, text-fig. 129, pl. 159, figs. 3–4, pl. 262, figs. 8–9; Rathbun, 1933, p. 33, fig. 29.

Range: off northeast Yucatan (Gulf); Puerto Rico; St. Croix; Fernando de Noronha, Brazil.

Depth: 7 to 44 m (4 to 24 fm).

Habitat: rock and coral bottoms.

Remarks: Listed from Brazil by Coelho and Ramos (1972) and Fausto Filho (1974).

Thoe Bell, 1836

Thoe puella Stimpson, 1860 (Ann. Lyc. Nat. Hist. New York 7: 178)

Rathbun, 1925, p. 348, text-figs. 111–112, pl. 125, figs. 1–2; Rathbun, 1933, p. 21, fig. 24.

Range: Florida Keys and Dry Tortugas; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; Guadeloupe; Curaçao.

Depth: Shallow water.

Habitat: in and on coral reefs.

Subfamily OPHTHALMIINAE Balss, 1929

Picroceroides Miers, 1886

Picroceroides tubularis Miers, 1886 (*Challenger* Rept., Zool. 17: 77)

Rathbun, 1925, p. 354, text-fig. 115, pl. 126, pl. 254, figs. 2–5.

Range: Bahamas; southeast Florida; north and south coasts of Cuba; between Jamaica and Haiti: St. Thomas, Virgin Islands; Maranhão to Espirito Santo, Brazil.

Depth: shallow water to 110 m (to 60 fm).

Habitat: coral and broken shell bottoms.

Remarks: Listed from Brazil by Coelho (1971c), Coelho and Ramos (1972), and Fausto Filho (1974).

Pitho Bell, 1835

Pitho aculeata (Gibbes, 1850) (Proc. Amer. Assoc. Adv. Sci. 3: 171)

Rathbun, 1925, p. 357, text-fig. 116c, pl. 127, pl. 251, fig. 1; Rathbun, 1933, p. 23, fig. 26.

Range: Bahamas; Florida Keys and Dry Tortugas; west coast of Florida; north coast of Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; Guadeloupe; Old Providence Island (Carib.); Netherlands Antilles.

Depth: Shallow water.

Habitat: sand, shell, coral, grass, and mud bottoms; among algae in lagoons; on *Sargassum*; on banks at low tide.

Pitho anisodon (von Martens, 1872) (Arch. f. Naturg. 38: 83)

Rathbun, 1925, p. 368, text-figs. 116b, 117d, 118, pl. 131, pl. 251, fig. 2; Rathbun, 1933, p. 24.

Range: Bahamas; south, west, and northwest coasts of Florida; Florida Keys; north coast of Cuba; Jamaica; Puerto Rico; Guadeloupe; Curaçao, Netherlands Antilles.

Depth: shallow water to 22 m (to 12 fm).

Habitat: rock, sand, mud, coral, and grass bottoms.

Remarks: Reported from Florida by Wass (1955), Tabb and Manning (1961), Dragovich and Kelly (1964), Abele (1970), and Menzel (1971). Tabb and Manning (1961) noted the presence of ovigerous females in Florida Bay when salinities were fully marine and in Tampa Bay in March. Abele (1970) remarked on the variability of lateral and orbital spines with size of crab.

Pitho laevigata (A. Milne Edwards, 1875) (Crust. Rég. Mex., p. 116)

Rathbun, 1925, p. 372, pl. 132, figs. 3–4, pl. 133, fig. 3, pl. 250, figs. 11–13.

Range: west and northwest coasts of Florida; Antilles, loc. unspec.; Colombia; Trinidad.

Depth: shallow water, listed from 10.5 m (about 6 fm).

Habitat: coral, rock, and grass bottoms.

Remarks: Listed from northwest Florida by Wass (1955). Rathbun (1925) described a variety of this crab based on a female collected from the west coast of Florida.

Pitho lherminieri (Schramm, 1867) (Crust. Guadeloupe, Desbonne & Schramm, p. 20)

Hay & Shore, 1918, p. 459, pl. 38, fig. 8; Rathbun, 1925, p. 362, text-fig. 116a, 117b, pl. 128, figs. 1–2, pl. 129, figs. 1–2, pl. 252, fig. 2; Rathbun, 1933, p. 24; Williams, 1965, p. 246, figs. 224, 233A.

Range: North and South Carolina; Bahamas; Florida Keys; west and northwest coasts of Florida; Vera Cruz, Mexico; north coast of Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands to Martinique; Old Providence Island (Carib.); Curaçao; Cape St. Roque to São Paulo, Brazil.

Depth: shallow water to 51 m (to 28 fm), rarely to 220 m (120 fm).

Habitat: coral, sand, shell, rock, and grass bottoms; rarely on mud.

Remarks: Listed from northwest Florida by Wass (1955); recorded from Brazil by Coelho (1971c), Coelho and Ramos (1972) and Fausto Filho (1974). Ovigerous females have been collected from the Bahamas and Florida in May to November and from Brazil in December (Williams, 1965).

Pitho mirabilis (Herbst, 1794) (Naturg. Krabben u. Krebse, vol. 2, p. 152)

Rathbun, 1925, p. 366, text-figs. 116d, 117c, pl. 128, fig. 3, pl. 129, fig. 3, pl. 253, fig. 1; Rathbun, 1933, p. 24.

Range: Bahamas; Florida Keys; Puerto Rico; Guadeloupe.

Depth: shallow water.

Habitat: rock and coral bottoms.

Remarks: Only part of the original species description by Herbst is valid (Rathbun, 1925).

Tyche Bell, 1835

Tyche emarginata White, 1847 (Ann. Mag. Nat. Hist. 20: 206)

Hay & Shore, 1918, p. 461, pl. 39, fig. 4; Rathbun, 1925, p. 508, pl. 272, pl. 273, figs. 7–12; Garth, 1946, p. 406, text-fig. 1; Williams, 1965, p. 247, figs. 225, 226, 233B.

Range: North Carolina; Bahamas; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; St. Thomas, Virgin Islands; Guadeloupe; Cape St. Roque, Brazil.

Depth: shallow water to 37 m (to 20 fm).

Habitat: shell and rock bottoms.

Remarks: Garth (1946) compared this species with its Pacific analogue, *T. lamellifrons*. Listed from Florida by Wass (1955) and Lyons *et al.* (1971) and from the Gulf collections of the R/V *Oregon* by Chace (1956).

Subfamily PISINAE Dana, 1852

Chorinus Latreille, 1825

Chorinus heros (Herbst, 1790) (Naturg. Krabben u. Krebse, vol. 1, pl. 18, fig. 2)

Rathbun, 1925, p. 305, text-fig. 101, pl. 107, pl. 246, figs. 3–5; Rathbun, 1933, p. 20, fig. 21.

Range: Bermuda; Florida Keys and Dry Tortugas; Cuba; Caribbean coast of Yucatan, Mexico; Jamaica; Hispaniola; Puerto Rico; St. Croix; Barbados; Ceará to Bahia, Brazil.

Depth: shallow water to 48 m (to 26 fm).

Habitat: sand, shell, rock, and coral bottoms.

Remarks: Listed from the Gulf of Mexico by Chace (1956) and from Brazil by Coelho (1971c) and Coelho and Ramos (1972).

Holoplites Rathbun, 1894

Holoplites armata (A. Milne Edwards, 1880) (Crust. Rég. Mex., p. 348)

Rathbun, 1925, p. 307, text-fig. 102, pl. 108, pl. 245, figs. 6–8; Chace, 1940, p. 64; Bullis & Thompson, 1965, p. 12.

Range: north coast of Cuba; St. Vincent; Grenadines; Barbados; Pará, Brazil.
Depth: 161 to 798 m (88 to 387 fm).
Habitat: coral, shell, and rock bottoms.
Remarks: Listed from Brazil by Coelho and Ramos (1972).

Libinia Leach, 1815

Libinia dubia H. Milne Edwards, 1834 (Hist. Nat. Crust., vol. 1, p. 300)

Hay & Shore, 1918, p. 456, pl. 38, fig. 5; Rathbun, 1925, p. 313, text-figs. 105–106, pls. 114–115, 122, fig. 1; Williams, 1965, p. 252, figs. 232, 233G; Felder, 1973a, p. 52, pl. 7, fig. 8.

Range: Cape Cod, Massachusetts to south Florida; Bahamas; Florida Keys; west Florida to south Texas; Cuba; off Gabon, western Africa.

Depth: shallow water to 46 m (to 25 fm).

Habitat: primarily on mud and mud-sand substrates; also on sand, gravel, and shell bottoms; often near shore and occasionally in tide pools. Juveniles are usually covered with hydroids, ascidians, sponges, etc., but older adults are almost always clean.

Remarks: Gulf reports of this species may be confused with those for *L. emarginata*, especially records of juveniles for which identification is difficult and further complicated by the variety of attached organisms. Regional lists include Florida (Wass, 1955; Tabb and Manning, 1961; Dragovich and Kelly, 1964; Lyons *et al.*, 1971; Menzel, 1971), Mississippi (Richmond, 1962; Christmas and Langley, 1973), Louisiana (Behre, 1950; Hoese and Valentine, 1972), and Texas (Leary, 1967). Fotheringham and Brunenmeister (1975) describe some aspects of natural history for this crab in the Gulf.

Tabb and Manning (1961) found that larger adults were prevalent in the sponge-algae areas of Florida Bay, whereas smaller individuals were more common in the *Thalassia* beds. Wass (1955) states that this species is more common than *L. emarginata* in the shallower harbor and bay waters, but that the reverse is true in the more marine outer waters of northwest Florida. This crab occurred in salinity ranges of 20.4 to 39 ppt in Texas bays after a drought (Hoese, 1960) and down to 12 ppt at Crystal River, Florida (Lyons *et al.*, 1971). In Tampa Bay, juveniles are common on *Gracilaria* beds and this species is the most common spider crab of the area (Dragovich and Kelly, 1964). Ovigerous females have been reported in Florida from January to July (Dragovich and Kelly, 1964; Lyons *et al.*, 1971).

Several authors have commented on the presence of young *L. dubia* in or on the cabbagehead jellyfish, *Stomolophus meleagris*. Corrington (1927) and Gutsell (1928) record this relationship in Carolina waters and Williams (1965) states that small crabs have been found in the genital pits and subumbrellar space.

Jachowski (1963) noted a similar relationship with *Aurelia aurita*. Wass (1955) noted that one female crab was covered with 93 barnacles (*Balanus*) and Pearse (1952) reported copepods in the gills and on the carapace of this crab in Texas waters.

Development of this species in the laboratory was described by Sandifer and van Engel (1971). Ayres (1938) compared relationships between habitat and oxygen consumption and Gray (1957) correlated habitat and gill surface area in this species. Other physiological studies include tolerance to desiccation and salinity changes (Pearse, 1929) and the physiological activity and neurosecretions of the pericardial organs (Berlind and Cooke, 1970).

Libinia emarginata Leach, 1815 (Zool. Misc., 2: 130)

Common Name: Common Spider Crab

> Hay & Shore, 1918, p. 456, pl. 38, fig. 6; Rathbun, 1925, p. 311, text-figs. 103–104, pls. 110–113; Williams, 1965, p. 252, figs. 231, 233H; Felder, 1973a, p. 52, pl. 7, fig. 7.

Range: Nova Scotia to south Florida; Florida Keys; west coast of Florida to Mexico. Pacific coast records are probably erroneous (Garth, 1958).

Depth: shore to 49 m (to 27 fm), rarely to 124 m (68 fm).

Habitat: on all types of substrates, but most common on mud and mud-sand in shallow waters.

Remarks: Gulf records of this species and *L. dubia* may be confused due to similarity of the juvenile stages. Wass (1955) compares the key morphological features of the two species. Listed from Florida (Wass, 1955; Menzel, 1971), Mississippi (Richmond, 1962; Franks *et al.*, 1972), Louisiana (Behre, 1950; Hoese and Valentine, 1972), Texas (Gunter, 1950; Hildebrand, 1954; Parker, 1959; Leary, 1967), Mexico (Hildebrand, 1954), and the Gulf of Mexico (Chace, 1956).

Hildebrand (1954) states that this species is the most common large spider crab in the western Gulf of Mexico, reversing the numerical dominance relationship with *L. dubia* that is found in the eastern Gulf. Like *L. dubia*, young *L. emarginata* are often associated with the cabbagehead jellyfish, *Stomolophus meleagris*. Ovigerous females are present in the western Gulf in February and are common in July. Hoese and Valentine (1972) collected a crab from the Chandeleur Islands that was covered with the bryozoan, *Bugula*. Musick and McEachran (1972) reported a depth range of 18 to 51 m for this crab in Chesapeake Bight. Aldrich (1976) reported predation by this crab on the starfish, *Asterias*. Forward (1977) described shadow responses of the larval stages.

Other studies include: measurement of gill surface area in relation to habitat (Gray, 1957), biochemical adaptations to temperature variation (Vernberg and Vernberg, 1968), osmoregulation (Gilles, 1970), physiology of molting (Skinner and Graham, 1972), sterol synthesis in larval stages (Whitney, 1969), vitellogenesis (Hinsch and Cone, 1969), sperm structure (Hinsch, 1973), growth biometrics (Aldrich, 1974), reproductive physiology (Hinsch, 1970), neural fine structure (Skobe and Nunnemacher, 1970), antennule chemosensitivity (Haz-

lett, 1971), pericardial organ neurosecretion (Berlind and Cook, 1970), and behavior related to copulation and reproduction (Hinsch, 1968).

Libinia erinacea (A. Milne Edwards, 1879) (Crust. Rég. Mex., p. 202)

Rathbun, 1925, p. 321, pl. 109.

Range: Florida Keys; southeast to northwest Florida; north coast of Cuba.

Depth: 4 to 68 m (2 to 37 fm).

Habitat: sand-mud and rock bottoms; in patches of moss.

Remarks: The status of this species is confused due to a paucity of mature specimens. Rathbun (1925) remarked on the close resemblance of this species to *L. dubia*, but she also listed differences between the two forms. Tabb and Manning (1961) also questioned the status of this crab as a distinct species and Abele (1970) compared the types of the two species and concluded that further examination of more mature specimens will be required. Abele (1970) also noted that the type specimen of *L. erinacea* is in the Museum of Comparative Zoology (Harvard) and not in the Paris Museum, as indicated by Rathbun (1925). Listed as uncommon at Apalachee Bay, Florida by Menzel (1971).

Libinia rhomboidea Streets, 1870 (Proc. Acad. Nat. Sci. Philadelphia, p. 106)

Rathbun, 1925, p. 323, pls. 116–117, pl. 245, figs. 1–3.

Range: west and north coasts of Cuba; off Merida, Yucatan (Gulf coast).

Depth and Habitat: no data available.

Remarks: Rathbun (1925) believed that the type locality of "East Indies" was probably an error. She also compared this species with *L. dubia* and noted variation in size of the spines.

Nibilia A. Milne Edwards, 1878

Nibilia antilocapra (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 110)

Rathbun, 1925, p. 290, text-fig. 97, pls. 102–103, 239; Williams, 1965, p. 251, figs. 230, 233F.

Range: North Carolina; southeast Florida; off Mobile, Alabama; Gulf of Campeche, Mexico; St. Vincent; Barbados.

Depth: 71 to 256 m (39 to 140 fm).

Habitat: mud, sand, broken shell, rock, and coral bottoms.

Remarks: Ovigerous females were collected at St. Vincent in February and at Barbados in March (Rathbun, 1925). Recorded by Chace (1956) from the Gulf of Mexico, some distance west of Dry Tortugas.

Pelia Bell, 1836

Pelia mutica (Gibbes, 1850) (Proc. Amer. Assoc. Adv. Sci. 3: 171)

Hay & Shore, 1918, p. 455, pl. 38, fig. 7; Rathbun, 1925, p. 278, text-fig. 94, pl. 98, figs. 2–3; Rathbun, 1933, p. 18, fig. 19; Williams, 1965, p. 250, figs. 229, 233E; Felder, 1973a, p. 53, pl. 7, fig. 13.

Range: Massachusetts to south Florida; Florida Keys; west coast of Florida to

south Texas; north coast of Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands.

Depth: shallow water to 51 m (to 28 fm).

Habitat: shell or rock rubble; mud, sand, gravel, and coral substrates; among hydroids, ascidians, and sponges on wharf pilings; from *Chaetopterus* tubes.

Remarks: Ovigerous females have been collected from Florida in February to July, through the summer in the Carolinas, and from Massachusetts in July. Regional lists include Florida (Wass, 1955; Tabb and Manning, 1961; Menzel, 1971), Louisiana (Behre, 1950; Hoese and Valentine, 1972), and Texas (Felder, 1973a). Tabb and Manning (1961) reported that all of the crabs collected in Florida Bay were covered with algae, sponges, or hydroids; Wass (1955) noted that this crab is common in clumps of the ascidian, *Styela*. Gray (1961) reported the crab in tubes of the annelid, *Chaetopterus*, in North Carolina. Hartnoll (1965a) studied growth and other aspects of biology of this species in Jamaica.

Rochinia A. Milne Edwards, 1875

Rochinia crassa (A. Milne Edwards, 1879) (Crust. Rég. Mex., p. 203)

Rathbun, 1925, p. 210, text-figs. 83–84, pls. 68–69, 226; Chace, 1940, p. 62; Williams, McCloskey & Gray, 1968, p. 60; Pequegnat, 1970, p. 183.

Range: Massachusetts to south Florida; Florida Straits; off Alabama and Texas; east coast of Mexico; north coast of Cuba.

Depth: 128 to 860 m (70 to 470 fm).

Habitat: mud, sand, and coral oozes.

Remarks: Rathbun (1925) reported ovigerous females from off South Carolina in December. Musick and McEachran (1972) listed this crab from 194 m depth in Chesapeake Bight. Listed by Chace (1956) from the R/V *Oregon* collections in the Gulf of Mexico.

Rochinia hystrix (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 124)

Rathbun, 1925, p. 214, pls. 70–71; Rathbun, 1933, p. 17, fig. 17; Chace, 1940, p. 62.

Range: Florida Keys and Dry Tortugas; north coast of Cuba; off northwest Florida and Mississippi; Puerto Rico; Martinique to Barbados.

Depth: 150 to 708 m (82 to 387 fm).

Habitat: sand, coral, and rocky substrates.

Remarks: Rathbun (1925) listed ovigerous females from off Key West in February. Chace (1940) commented on sample numbers from off Cuba and Chace (1956) listed this species from the Gulf collections of the R/V *Oregon*.

Rochinia tanneri (Smith, 1883) (Proc. U.S. Nat. Mus. 6: 4)

Rathbun, 1925, p. 216, pl. 227, fig. 1; Williams, McCloskey & Gray, 1968, p. 60, fig. 15.

Range: Massachusetts to North Carolina; southeast Florida; off Key West and Florida Straits.

Depth: 128 to 708 m (70 to 387 fm).

Habitat: sand and shell bottoms.

Rochinia umbonata (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 115)

Rathbun, 1925, p. 222, text-fig. 85, pl. 72, pl. 73, fig. 1; Chace, 1940, p. 63; Williams, McCloskey & Gray, 1968, fig. 16; Pequegnat, 1970, p. 183.

Range: North Carolina to south Florida; Florida Straits, off Key West; off Mississippi; St. Vincent, Windward Islands.

Depth: 161 to 900 m (88 to 492 fm).

Habitat: sand, gravel, coral, shell, and foraminiferan substrates.

Remarks: Listed by Chace (1956) from the Gulf of Mexico.

Family PARTHENOPIDAE Macleay, 1838

Subfamily PARTHENOPINAE Macleay, 1838

Cryptopodia H. Milne Edwards, 1834

Cryptopodia concava Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 137)

Rathbun, 1925, p. 553, text-fig. 151, pl. 202, figs. 3–4, pl. 282, figs. 6–11; Rathbun, 1933, p. 42, fig. 37; Williams, McCloskey & Gray, 1968, p. 64.

Range: off North Carolina; Bahamas; Florida Keys and Dry Tortugas; west coast of Florida; St. Thomas, Virgin Islands; Ceará to Bahia, Brazil.

Depth: 7 to 62 m (4 to 34 fm).

Habitat: mud, sand, shell, and coral bottoms.

Remarks: Listed from Brazil by Coelho and Ramos (1972).

Heterocrypta Stimpson, 1871

Heterocrypta granulata (Gibbes, 1850) (Proc. Amer. Assoc. Adv. Sci. 3: 173)

Common Name: Pentagon Crab

Hay & Shore, 1918, p. 464, pl. 39, fig. 9; Rathbun, 1925, p. 555, text-fig. 152, pl. 203, figs. 1–2, pl. 282, figs. 1–3; Rathbun, 1933, p. 43, fig. 38; Williams, 1965, p. 270, figs. 251, 252E; Felder, 1973a, p. 45, pl. 6, fig. 6.

Range: Massachusetts to Georgia; Florida Keys and Straits; west coast of Florida to south Texas; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; Ceará to Bahia, Brazil.

Depth: 4 to 137 m (2 to 75 fm).

Habitat: mud, sand, gravel, shell, rock, and coral bottoms; this crab is difficult to detect on pebble and shell substrates, where its form and coloration provide excellent camouflage.

Remarks: Williams (1965) reports ovigerous females throughout the summer off North Carolina. Regional lists include Florida (Wass, 1955; Tabb and Manning, 1961; Dragovich and Kelly, 1964; Rouse, 1970; Menzel, 1971), Louisiana (Behre, 1950) and Texas (Hedgpeth, 1953; Parker, 1959; Leary, 1967). Listed from Brazil by Coelho and Ramos (1972).

Leiolambrus A. Milne Edwards, 1878

Leiolambrus nitidus Rathbun, 1901 (Bull. U.S. Fish. Comm. 20: 80)

Rathbun, 1925, p. 545, pl. 199, pl. 281, fig. 1; Rathbun, 1933, p. 41, fig. 35; Guinot-Dumortier, 1960, p. 182, figs. 23a–b, 26; Felder, 1973a, p. 45, pl. 6, fig. 7.

Range: Gulf of Mexico, from off Alabama to south Texas; Jamaica; Puerto Rico; French Guiana.

Depth: 7 to 73 m (4 to 40 fm).

Habitat: mud, mud-sand, and mud-shell bottoms.

Remarks: Regional lists include Alabama (Chace, 1956), Louisiana (Dawson, 1966), and Texas (Hildebrand, 1954; Leary, 1967). Hildebrand (1954) reported ovigerous females from off Texas in June. Listed from French Guiana by Guinot-Dumortier (1960).

Mesorhoea Stimpson, 1871

Mesorhoea sexspinosa Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 136)

Rathbun, 1925, p. 547, text-fig. 150, pl. 200; Rathbun, 1933, p. 42, fig. 36; Williams, McCloskey & Gray, 1968, p. 64, fig. 17.

Range: North Carolina; Florida Keys and Dry Tortugas; northwest coast of Florida; Puerto Rico; Virgin Islands.

Depth: 7 to 49 m (4 to 27 fm).

Habitat: sand and shell substrates.

Remarks: Rathbun (1925) reported an ovigerous female from off northwest Florida in January.

Parthenope Weber, 1795

Parthenope (Parthenope) agonus (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 131)

As ***P. agona***—Hay & Shore, 1918, p. 462, pl. 39, fig. 5; Williams, 1965, p. 266, figs. 246, 252A; Pequegnat, 1970, p. 183.
As ***P. agonus***—Rathbun, 1925, p. 513, text-fig. 146, pls. 178–179, pl. 275, figs. 1–3; Rathbun, 1933, p. 39.

Range: North Carolina; Florida Straits; Dry Tortugas; west coast of Florida; Puerto Rico; Trinidad; off Guianas.

Depth: 46 to 391 m (25 to 214 fm).

Habitat: sand, broken shell, gravel, coral, and mud bottoms.

Remarks: Ovigerous females were reported from northwest Florida in March (Rathbun, 1925) and from the Guianas in September (Williams, 1965). Chace (1956) lists this crab from the eastern Gulf of Mexico.

Subgenus ***Platylambrus*** Stimpson, 1871

Parthenope (Platylambrus) fraterculus (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 130)

Rathbun, 1925, p. 525, pls. 186–187, pl. 190, fig. 2; Williams, 1965, p. 269, figs. 249, 252D.

Range: North Carolina; southeast Florida; Florida Keys and Straits; Dry Tortugas; west and northwest coasts of Florida; northeast coast of Yucatan; Barbados; mouth of Amazon River, Brazil; Surinam.

Depth: 7 to 201 m (4 to 110 fm).

Habitat: sand, shell, gravel, rock, and coral bottoms.

Remarks: Williams (1965) listed ovigerous females from south Florida in May and from northwestern Florida in August. Listed by Chace (1956) from the northwestern Gulf of Mexico and by Holthuis (1959) from Surinam.

Parthenope (Platylambrus) pourtalesii (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 129)

> Hay & Shore, 1918, p. 462, pl. 39, fig. 6; Rathbun, 1925, p. 521, pls. 182–183, 276; Rathbun, 1933, p. 39, fig. 33; Chace, 1940, p. 53; Williams, 1965, p. 268, figs. 248, 252C; Pequegnat, 1970, p. 183; Felder, 1973a, p. 48, pl. 6, fig. 9.

Range: New Jersey to south Florida; Florida Keys and Straits; Dry Tortugas; north coast of Yucatan; off north coast of Cuba; Grenada.

Depth: 18 to 348 m (10 to 190 fm).

Habitat: primarily mud and sand-mud bottoms; also on sand, shell, and gravel substrates. Pequegnat (1970) states that Gulf populations are probably centered at the middle of the continental shelf.

Remarks: Ovigerous females are known from North Carolina in December (Williams, 1965) and from the southeast Gulf in July (Pequegnat, 1970). Listed by Chace (1956) from off Yucatan. Leary (1967) includes this species on a Texas list and this is repeated by Felder (1973a), but I know of no actual records to confirm collection of this crab in the northwestern Gulf.

Parthenope (Platylambrus) serrata (H. Milne Edwards, 1834) (Hist. Nat. Crust., vol. 1, p. 357)

> As ***Platylambrus serratus***—Hay & Shore, 1918, p. 463, pl. 39, fig. 7.
> As ***Parthenope serrata***—Rathbun, 1925, p. 516, pls. 180–181, pl. 275, figs. 7–10; Rathbun, 1933, p. 39; Williams, 1965, p. 267, figs. 247, 252B; Türkay, 1968, p. 251; Felder, 1973a, p. 45, pl. 6, fig. 8.

Range: North Carolina; Bermuda; Bahamas; southeast and south Florida; Florida Keys and Dry Tortugas; west Florida to off Texas; Bay of Campeche, off Yucatan; north coast of Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; Curaçao; Surinam; Bahia, Brazil.

Depth: shallow water to 110 m (to 60 fm).

Habitat: mainly on mud and mud-sand bottoms; also from sand, shell, gravel and coral substrates.

Remarks: Gore (1977) reviews this species and concludes that two distinct species have been confused under this name. Ovigerous females are listed from North Carolina in June, from Florida in summer, from Cuba in October, and from Surinam in May to June (Williams, 1965). Hildebrand (1955) reported this crab present on the pink shrimp grounds at Campeche. Wass (1955) and Menzel (1971) indicated that this crab was rare off northwestern Florida; Chace (1956) listed a single record from off Mississippi for the collections of the R/V *Oregon*. Listed from Texas by Leary (1967), but Felder (1973a) cites only a

single collection record from the northwestern Gulf, a specimen taken from a snapper stomach off south Texas. Listed from Surinam by Holthuis (1959).

Solenolambrus Stimpson, 1871

Solenolambrus decemspinosus Rathbun, 1894 (Proc. U.S. Nat. Mus. 17: 84)

Rathbun, 1925, p. 540, pl. 194, figs. 1–2; Rathbun, 1933, p. 41.

Range: off northwest Florida; Puerto Rico.
Depth: 82 to 110 m (45 to 60 fm).
Habitat: sand and sand-mud bottoms.

Solenolambrus tenellus Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 134)

Hay & Shore, 1918, p. 463, pl. 39, fig. 8; Rathbun, 1925, p. 541, pl. 194, figs. 3–4, pl. 279, figs. 5–9; Rathbun, 1933, p. 41; Williams, 1965, p. 270, fig. 250.

Range: North Carolina; southeast Florida; Bahamas; Florida Keys; west coast of Florida; Barbados.
Depth: 55 to 210 m (30 to 115 fm).
Habitat: sand, broken coral, and rocky bottoms.
Remarks: Ovigerous females are known from Florida in May-June and from Barbados in May (Rathbun, 1925).

Solenolambrus typicus Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 133)

Rathbun, 1925, p. 537, text-fig. 148, pls. 192–193, pl. 279, figs. 1–4; Rathbun, 1933, p. 40, fig. 34; Chace, 1940, p. 53; Williams, McCloskey & Gray, 1968, p. 63; Pequegnat, 1970, p. 184.

Range: North Carolina; Bahamas; southeast Florida; Florida Keys and Straits; Dry Tortugas; off Texas; north and south coasts of Cuba.
Depth: 91 to 618 m (50 to 338 fm).
Habitat: sand, broken shell, and coral substrates.
Remarks: Location of the R/V *Alaminos* record is confused. Table 6–9 of Pequegnat (1970, p. 201) lists this species from the southwestern Gulf and a synopsis of distribution (p. 184) includes a range from the Bahamas to northwest Florida, but the actual collecting station of record (64-A-10-13) is located off south Texas.

Thryrolambrus Rathbun, 1894

Thyrolambrus astroides Rathbun, 1894 (Proc. U.S. Nat. Mus. 17: 83)

Rathbun, 1925, p. 532, text-fig. 147, pl. 196, pl. 280, figs. 5–6.

Range: off north coast of Cuba; Mauritius and Andaman Sea, in the Indo-Pacific region.
Depth: 123 to 366 m (67 to 200 fm) off Cuba; 66 m (36 fm) in Andaman Sea.
Habitat: coral bottoms.

Tutankhamen Rathbun, 1925

Tutankhamen cristatipes (A. Milne Edwards, 1880) (Crust. Rég. Mex., p. 352)

Rathbun, 1925, p. 530, pl. 277, figs. 3–5.

Range: Pourtales Plateau, Florida Straits; St. Vincent, Windward Islands.
Depth: 227 to 366 m (124 to 200 fm).

SECTION CANCRIDEA Latreille, 1803

Superfamily CANCROIDEA Latreille, 1803

Family ATELECYCLIDAE Ortmann, 1893

Subfamily ATELECYCLINAE Ortmann, 1893

Trachycarcinus Faxon, 1893

Trachycarcinus spinulifer Rathbun, 1898.

Determined by Pequegnat (1970) to be a synonym of *Trichopeltarion nobile* A. Milne Edwards, to which all previous records are referred.

Trichopeltarion A. Milne Edwards, 1880

Trichopeltarion nobile A. Milne Edwards, 1880 (Bull. Mus. Comp. Zool. 8: 20)

As ***Trachycarcinus spinulifer***—Rathbun, 1930, p. 166, text-figs. 26–27, pls. 70–71.
As ***Trichopeltarion nobile***—Rathbun, 1930, p. 168, pl. 73; Pequegnat, 1970, p. 184, figs. 6–4, 6–5.

Range: off northwest Florida and Mississippi; east coast of Mexico; Bay of Campeche; off St. Lucia.
Depth: 274 to 752 m (150 to 411 fm).
Habitat: mud bottoms.
Remarks: Pequegnat (1970) synonymized the two species on the basis of fresh material collected by the R/V *Alaminos* in the Gulf of Mexico. The largest of 9 females collected was ovigerous, from 195 fm depth, in September. Listed by Chace (1956), as *T. spinulifer*, from off Mississippi.

Family CANCRIDAE Latreille, 1803.

Subfamily CANCRINAE Latreille, 1803

Cancer Linnaeus, 1758

Cancer borealis Stimpson, 1859 (Ann. Lyc. Nat. Hist. New York 7: 50)

Common Names: Jonah Crab; Northern Crab

Hay & Shore, 1918, p. 434, pl. 35, fig. 2; Rathbun, 1930, p. 182, text-figs. 30–31; Chace, 1940, p. 38; Williams, 1965, p. 175, fig. 156.

Range: Nova Scotia to east coast of Florida; Bermuda; south coast of Florida; south of Dry Tortugas, in Florida Straits.

Depth: intertidal to 796 m (to 435 fm).

Habitat: immature and sub-adult stages occur intertidally among rocks and in shallower harbors and bays; larger specimens are found over a wide range of depths on sand, shell, gravel, mud, and ooze substrates.

Remarks: Ovigerous females were listed from Florida in June (Williams, 1965). This species has been collected in the western portions of the Florida Straits and can be considered to inhabit the Gulf of Mexico. *Cancer irroratus* Say, 1817 has been collected in the Florida Straits slightly west of 80° W, but is more typically restricted to the Atlantic coast and is not included in the Gulf fauna at the present time (based on pers. comm. of F. A. Chace).

SECTION BRACHYRHYNCHA Borradaile, 1907

(This group of crabs includes over 3000 species, world-wide. Older systematic literature traditionally divided the Brachyrhyncha into two subgroups, based on the general shape of the carapace: the Cyclometopa (round-fronted) or "cancroid" crabs and the Catametopa (square-fronted) or "grapsoid" crabs. The first group, as treated by Rathbun (1930), consisted of the families Portunidae, Xanthidae, Potamidae, Atelecyclidae, and Cancridae. These last two families are treated by some authors and in the present list within a separate section, the Cancridea, following the format of Glaessner (1969). Sakai (1965) groups the Goneplacidae with the other cancroid families in his key to the Brachyrhyncha, whereas Rathbun (1918) treated the Goneplacidae as a grapsoid family. This family has long been recognized as containing genera that link certain genera of the Xanthidae and Grapsidae, thus blurring many of the sharp distinctions between graspoid and cancroid characteristics. The position of the Palicidae is treated as "uncertain" by Glaessner (1969), but it is included here with the Xanthoidea as a matter of convenience, suggested by Chace (pers. comm.)).

Superfamily PORTUNOIDEA Rafinesque, 1815.

Family PORTUNIDAE Rafinesque, 1815

Subfamily POLYBIINAE Ortmann, 1893

(*Ovalipes* is listed as a genus of the Macropipinae in Glaessner (1969), but an addendum, p. R627, indicates the synonymy with Polybiinae.)

Bathynectes Stimpson, 1871

Bathynectes superba (Costa, 1853) (Fauna Regno Napoli, Addiz. Decapodi Brachyuri, p. 19)

Milne Edwards & Bouvier, 1923, p. 311; Rathbun, 1930, p. 28, pls. 9–10; Chace, 1940, p. 30; Monod, 1956, p. 183, figs. 210–212; Williams, McCloskey & Gray, 1968, p. 50; Christiansen, 1969, p. 70, fig. 28, map 22.

Range: Massachusetts to south Florida; Florida Keys and Straits; west of Dry Tortugas and mid-eastern Gulf of Mexico; off Alabama and Mississippi; northeast of Yucatan; north and south coasts of Cuba; in the eastern Atlantic—Norway; north of Scotland; west coast of France; Cape Verde Islands; Mediterranean and Black Seas.

Depth: 100 to 1455 m (55 to 769 fm).

Habitat: on sand, gravel, shell and coral bottoms; rocky areas.

Remarks: Most of the Gulf of Mexico records are from Chace (1956). Musick and McEachran (1972) collected this crab at depths of 159 to 274 m in Chesapeake Bight. Roberts (1969) studied larval development and epizoites of this species were described by Lewis (1976).

Benthochascon Alcock & Anderson, 1899

Benthochascon schmitti Rathbun, 1931 (J. Washington Acad. Sci. 21: 125)

Rathbun, 1931a, p. 125, pls. 1–2; Pequegnat, 1970, p. 187, fig. 6–6.

Range: off Dry Tortugas; deep waters off Mississippi to Texas; off southern Gulf coast of Mexico; recently found off New England.

Depth: 201 to 510 m (110 to 279 fm).

Habitat: mud, silt-clay substrates.

Remarks: This species was first reported from the Dry Tortugas by Rathbun (1931a), based on a specimen collected by W. L. Schmitt. Schmitt (1931) provided some note on this crab. Reported by Chace (1956) from the Gulf collections of the R/V *Oregon*. Pequegnat (1970) collected numerous specimens from various parts of the Gulf of Mexico and Wigley and Messersmith (1976) collected a single male from 252 m depth off southern New England.

Ovalipes Rathbun, 1898

(This genus has undergone a number of recent revisions, resulting in considerable confusion to non-specialists and complicating the comparison of field records in the non-systematic literature. Prior to revision by Williams (1962), *Ovalipes ocellatus* was considered to be represented in the Atlantic by the typical form and in the Gulf of Mexico by a subspecies, *O. o. guadulpensis*. Many of the earlier surveys and checklists reported *O. ocellatus* from the Gulf, but without specifying subspecies or authority. Felder (1973a) listed both forms for the northwestern Gulf, but with reservations, noting the nomenclatural confusion in the records. Türkay (1971) had discovered, in the meantime, that the original type of Saussure's *guadulpensis* belonged to the genus *Macropipus* and not *Ovalipes* and that it was named for a locality in the Azores rather than in the Caribbean. The next available name for the western Atlantic form thus became *Ovalipes ocellatus floridanus*, as used by Hay and Shore (1918) and recognized by Türkay (1971). Two forms of this crab were recognized by Williams (1962, 1965) and by Stephenson and Rees (1968), *Form a* from the Carolinian Province off the southeastern United States and *Form b* from the Gulf of Mexico. Williams (1976) finally

presented evidence that the two forms of *O. o. floridanus* should be regarded as separate species, but only one, *O. floridanus*, inhabits the Gulf of Mexico. See Williams (1976) for a nomenclatural history of these species.)

Ovalipes floridanus Hay & Shore, 1918 (Bull. U.S. Bur. Fish. 35: 427)

Common Names: Lady Crab; Sand Crab

As ***O. ocellatus floridanus***—Hay & Shore, 1918, p. 427, pl. 32, fig. 8; Türkay, 1971, p. 139, fig. 3.
As ***O. ocellatus guadulpensis***—Rathbun, 1930, p. 23, pl. 4 (part, the Pensacola, Alabama, and Gulf of Mexico specimens).
As ***O. guadulpensis (Form b)***—Stephenson & Rees, 1968, p. 243, pls. 37D, 40F, 41E, 42K, fig. 1K.
As ***O. guadulpensis***—Williams, 1965, p. 161 (part, Gulf specimens only); Felder, 1973a, p. 54, pl. 8, fig. 2.
As ***O. floridanus***—Williams, 1976, p. 206, fig. 1a–d.

Range: southwest Florida to south Texas.

Depth: near surface and shallow water to 31 m (to 17 fm).

Habitat: mainly sandy substrates; also on coral and broken shell bottoms. In coastal lagoons, channels, and bays in southern and central Texas.

Remarks: Williams (1976) describes and compares the two species of Ovalipes previously considered to be *O. guadulpensis*. The Carolinian form was named *O. stephensoni*, Form a of Stephenson and Rees (1968). The type locality for *O. floridanus* is Pensacola, Florida. Williams (1976) lists ovigerous females in February from Florida. Abele (1970) noted that juveniles were common on shallow grass flats in northwest Florida, while adults were more often found offshore on sandy bottoms. Regional lists include, as *O. guadulpensis* or *O. ocellatus guadulpensis*, Florida (Wass, 1955, Abele, 1970; Menzel, 1971), Mississippi (Richmond, 1962; Franks *et al.*, 1972; Christmas and Langley, 1973), Louisiana (Behre, 1950; Hildebrand, 1954), Texas (Gunter, 1950; Leary, 1967), and the northwestern Gulf (Fotheringham and Brunenmeister, 1975). Caine (1974) provided a detailed description of feeding behavior, ecology, and burrowing activities. Abele (1970) commented on behavior of the animal in sand substrates. Notes on the related species are provided in Williams (1965).

Ovalipes guadulpensis and ***Ovalipes ocellatus guadulpensis*** (Saussure, 1858).

Both names are invalid and all Gulf of Mexico reports should be referred to *Ovalipes floridanus* Hay and Shore, 1918. See Williams (1976) for a review of the nomenclatural history of this species.

Subfamily PORTUNINAE Rafinesque, 1815

Arenaeus Dana, 1851

Arenaeus cribrarius (Lamarck, 1818) (His. Nat. Anim. sans Vert., vol 5, p. 259)

Common Name: Speckled Crab

Hay & Shore, 1918, p. 434, pl. 34, fig. 3; Rathbun, 1930, p. 134, pl. 58, figs. 2–3,

pls. 59–60; Rathbun, 1933, p. 50; Williams, 1965, p. 173, fig. 153; Felder, 1973a, p. 55, pl. 8, fig. 4.

Range: Massachusetts to North Carolina; Bermuda; east coast of Florida; Florida Keys and Dry Tortugas; west coast of Florida to Tabasco, Mexico; Jamaica; Puerto Rico; Dominica to St. Lucia; Belize to Colombia; Curaçao; Ceará to Santa Catarina, Brazil.

Depth: shore to 68 m (to 37 fm).

Habitat: in surf zone of sandy beaches; an adroit swimmer, it is seldom washed ashore and it is rarely found in estuaries and back lagoons.

Remarks: Williams (1965) lists ovigerous females from Florida in August. Regional lists include Florida (Wass, 1955; Abele, 1970; Menzel, 1971), Mississippi (Richmond, 1962), off the Mississippi Delta (Chace, 1956), Louisiana (Behre, 1950; Hoese and Valentine, 1972), Texas (Gunter, 1950, Hildebrand, 1954), and the northwestern Gulf of Mexico (Fotheringham and Brunenmeister, 1975). Listed from Brazil by Coelho and Ramos (1972).

Callinectes Stimpson, 1860

(This commercially important genus has been revised and reviewed by Williams (1974a), including details of reproductive morphology, notes on larval development, fossil records, a discussion of zoogeographic affinities, and keys for the identification of the 14 species known worldwide. In the Gulf region, as well as elsewhere, confusion has existed as to the identity of the lesser or smaller blue crab species, cited locally as *Callinectes danae* and *C. ornatus*. A prior revision by Williams (1966) established a new species, *C. similis*, for the Gulf populations and many of the east coast specimens, limiting the former two species to the southeastern Gulf and beyond. The present list includes eight species in the Gulf of Mexico, five of which occur only in the eastern or southern margins of the region. Only *C. rathbunae* is endemic to the Gulf; *C. sapidus* and *C. similis* range widely along the U.S. Gulf and Atlantic coasts and beyond (see Figures 24–27 in Williams, 1974a).)

Callinectes bocourti A. Milne Edwards, 1879 (Crust. Rég. Mex., p. 226)

Rathbun, 1930, p. 128, text-figs. 15g, 16e, 17h, 18f, pl. 55; Rathbun, 1933, p. 49; Holthuis, 1959, p. 201, text-fig. 47, pl. 5, fig. 2; Chace & Hobbs, 1969, p. 127, text-figs. 35, 37a; Williams, 1974a, p. 767, figs. 12, 18j, 20m, 22j, 27.

Range: southeast Florida; Mississippi (rare); Jamaica; Hispaniola; Puerto Rico; Dominica; Virgin Islands to Barbados; Trinidad; Netherlands Antilles; Belize to Panama; Colombia to Santa Catarina, Brazil.

Depth: shallow water, near shore and inshore waters.

Habitat: in shallow, brackish waters of estuaries and river mouths. Tolerates salinities as low as 5 ppt; females usually move to saltier waters after mating. Williams (1974a) notes that this species is often associated with *C. sapidus*, but appears to be more tolerant than the latter to stagnant and polluted waters. Collected from a mud bottom in 3 m of water in Biloxi Bay, Mississippi (Perry, 1973). See Chace and Hobbs (1969) for extensive habitat notes in Dominica.

Remarks: The first reports of this species in North America were from Florida (Provenzano, 1961), from Mississippi, the only Gulf records (Perry, 1973), and a second Florida finding (Gore and Grizzle, 1974). Norse (1972) noted habitat preferences in Jamaica. Listed from Brazil by Coelho (1971a) and Coelho and Ramos (1972).

Callinectes danae Smith, 1869 (Trans. Connecticut Acad. Sci. 2: 7)

Rathbun, 1930, p. 118 (part)), text-figs. 15d, 16d, 17b, 18d, pl. 51; Rathbun, 1933, p. 49; Chace, 1940, p. 33; Chace & Hobbs, 1969, p. 130, fig. 37b; Holthuis, 1959, p. 201; Williams, 1966, p. 86, figs. 2A–D, 4C–D; Jones, 1968, p. 187; Williams, 1974a, p. 746, figs. 7, 18e, 20e–f, 22e, 24.

Range: Bermuda; southeast Florida; Dry Tortugas; north coast of Cuba; Caribbean coast of Yucatan; Jamaica; Hispaniola; Puerto Rico; St. Croix to Barbados; Trinidad; Netherlands Antilles; Belize to Panama; Colombia to Santa Catarina, Brazil.

Depth: shore to 75 m (to 41 fm).

Habitat: from nearly fresh to full sea water, possibly in hypersaline lagoons; Occurs among mangroves and in muddy estuaries in Brazil; Off beaches and in open water.

Remarks: Williams (1974a) believes that earlier records of this species from Chile are erroneous. Records of this species along the U.S. Gulf coast should be referred to *C. similis*, as per the revision by Williams (1966, 1974a). Records from east Florida indicated this crab's presence on the ocean side of islands in Biscayne Bay and its absence from the Florida Keys (Park, 1969). Norse (1972) noted habitat preferences in Jamaica. Listed from Brazil by Coelho and Ramos (1972). Morrison and Morrison (1952) studied hemolymph coagulation in Bermuda specimens.

Callinectes exasperatus (Gerstaecker 1856) (Arch. f. Naturg. 22: 129)

Rathbun, 1930, p. 130, text-figs. 15f, 16f, 17e, 18e, pl. 56; Contreras, 1930, p. 236, fig. 7; Rathbun, 1933, p. 49; Chace, 1940, p. 44; Chace & Hobbs, 1969, p. 131, fig. 37c; Felder, 1973a, p. 58, pl. 8, fig. 8; Williams, 1974a, p. 757, figs. 9, 18g, 20i, 22g, 26.

Range: Bermuda; Bahamas; southeast Florida; Florida Keys and Dry Tortugas; Vera Cruz to Yucatan, Mexico; north and south coasts of Cuba; Jamaica; Hispaniola; Puerto Rico; St. Croix to Grenadines; Trinidad; Netherlands Antilles; Caribbean coast of Yucatan to Panama; Venezuela and Isla de Margarita; Rio Grande do Norte to Santa Catarina, Brazil.

Depth: shore to 7.5 m (to 4 fm).

Habitat: estuarine and marine waters, possibly fresh water; around river mouths and in mangrove areas.

Remarks: Williams (1974a) comments on a lack of specimens from the Guianas and northern Brazil and that a locality record from Chile is erroneous. Leary (1967) listed this species from Texas on the basis of a single specimen from near Port Aransas, tentatively identified by Gordon Gunter, but not available for confirmation by Williams. Leary (1967) stated that the frontal teeth pattern was very similar to *C. danae* (= *C. similis*), thus the Gulf record for this

species is questionable. Felder (1973a) includes this species in his key for the northwestern Gulf on the basis of the same specimen. Reports of this crab in southern Florida are provided by Futch (1965) and Park (1969). Norse (1972) noted habitat preferences in Jamaica. Listed from Brazil by Coelho and Ramos (1972).

Callinectes marginatus (A. Milne Edwards, 1861) (Arch. Mus. Hist. Nat., Paris 10: 318)

> Rathbun, 1930, p. 123, figs. 15e, 16d, 17d, 18c, pl. 53; Contreras, 1930, p. 235, fig. 6; Rathbun, 1933, p. 49; Chace & Hobbs, 1969, p. 131, fig. 37d; Felder, 1973a, p. 59, pl. 8, fig. 9; Williams, 1974a, p. 722, figs. 3, 18b (not 18a), 20a, 22b, 27.

Range: North Carolina; Bermuda; Bahamas; southeast Florida; Florida Keys and Dry Tortugas; southwest Florida; Louisiana (rare); Vera Cruz to Yucatan, Mexico; north and south coasts of Cuba; Jamaica; Hispaniola; Puerto Rico; St. Croix to Grenadines; Tobago and Trinidad; Netherlands Antilles; Yucatan to Panama; Colombia to São Paulo, Brazil; in eastern Atlantic—Senegal to Angola; Mauritania; Cape Verde Islands.

Depth: intertidal to 15 m, rarely to 25 m (to 14 fm).

Habitat: shallow water on sand and mud flats; edges of mangrove swamps; grass flats, oyster bars, and rocky pools; often in brackish water, rarely in open marine water.

Remarks: The records from North Carolina and Louisiana are extralimital occurrences. Behre (1950) listed this crab as a common component of the *Sargassum* community in Louisiana waters, but Felder (1973a) commented that this species is by no means common and that Behre probably confused it with *Portunus sayi*. Williams (1974a) reports spawning records throughout the range of this crab, from December to July. Norse (1972) noted habitat preferences in Jamaica. Listed from Brazil by Coelho and Ramos (1972) and from West Africa by Forest and Guinot (1966).

Callinectes ornatus Ordway, 1863 (J. Boston Soc. Nat. Hist. 7: 571)

> Rathbun, 1930, p. 114 (part), text-figs. 15b, 16a, 17a, 18b, pl. 50; Contreras, 1930, p. 232 (part), fig. 4; Rathbun, 1933, p. 48, fig. 40; Chace, 1940, p. 33; Chace & Hobbs, 1969, p. 132, fig. 37e; Holthuis, 1959, p. 200; Williams, 1965, p. 172 (part); Williams, 1966, p. 84, figs. 1A–B, 4A–B; Williams, 1974a, p. 739, figs. 6, 18d, 20d, 22d, 25.

Range: Bermuda; Bahamas; North Carolina to south Florida; Florida Keys and Dry Tortugas; west Florida to Tampa Bay; Gulf coast of Yucatan; north and south coasts of Cuba; Jamaica; Hispaniola; Puerto Rico; St. Croix to Barbados; Trinidad; Netherlands Antilles; Caribbean coast of Yucatan to Belize; Colombia to Santa Catarina, Brazil.

Depth: shore to 75 m (41 fm).

Habitat: sand, mud, shell substrates; off sponges; near river mouths and bays; in fresh waters, but more common in waters of moderate salinities (Williams, 1974a).

Remarks: As with many portunids, juveniles of this species may be difficult to distinguish from others, especially those of *C. danae* and *C. similis*. Records

of *C. ornatus* in New Jersey, Louisiana, and Texas (Rathbun, 1930; Leary, 1967) should be referred to *C. similis*, based on the revision and restriction of this species by Williams (1966). Brues (1927) discussed the ecology of this crab and Norse (1972) noted habitat preferences for the species in Jamaica. Listed from Brazil by Coelho (1971a) and Coelho and Ramos (1972).

Callinectes rathbunae Contreras, 1930 (An. Inst. Biol. Univ. Nac. Auton., Mex. 1: 238)

Contreras, 1930, p. 238, figs. 9–10; Felder, 1973a, p. 58, pl. 8, fig. 10; Williams, 1974a, p. 772, figs. 13, 19a, 20n, 22k, 27.

Range: eastern coast of Mexico, from mouth of Rio Grande to southern Vera Cruz.

Depth: very shallow waters.

Habitat: estuarine waters of ditches, lagoons, and river mouths; in shallow coastal bays and a broad range of salinities.

Remarks: This species is apparently localized to the central Mexican coast, with occasional specimens as far north as the Rio Grande. Listed by Leary (1967) for Texas, based on a single male specimen found at the mouth of the Rio Grande River (H. H. Hildebrand, collector).

Callinectes sapidus Rathbun, 1896 (Proc. U.S. Nat. Mus. 18: 352)

Common Names: Blue Crab; Common Edible Crab

Hay & Shore, 1918, p. 432, pl. 35, fig. 1; Rathbun, 1930, p. 99, text-figs. 15a, 16c, 17c, 18a, 19, pl. 47; Holthuis, 1961, p. 50, pl. 1, fig. 2, pl. 2, fig. 2; Williams, 1965, p. 168, fig. 151; Chace & Hobbs, 1969, p. 133, figs. 36, 37f; Christiansen, 1969, p. 72, fig. 29; Felder, 1973a, p. 55, pl. 8, fig. 7; Williams, 1974a, p. 778, figs. 1, 16, 17, 19d, 21, 23b–c, 26.

As ***C. sapidus acutidens***—Rathbun, 1930, p. 111, text-fig. 15c, pl. 48; Contreras, 1930, p. 228, fig. 1; Rathbun, 1933, p. 48.

Range: Bermuda; Bahamas; Nova Scotia to south Florida; Florida Keys and Dry Tortugas; south Florida to Yucatan, along entire Gulf coast of the United States and Mexico; north and south coasts of Cuba; Jamaica; Haiti; Puerto Rico; Virgin Islands; Dominica; Trinidad and Tobago; Netherlands Antilles; Yucatan to Guatamala; Nicaragua to Panama; Venezuela; central Brazil to northern Argentina; in the eastern Atlantic—Denmark; Netherlands and adjacent North Sea; southwest France; Golfo di Genova; northern Adriatic Sea; Aegean Sea; western part of Black Sea; eastern Mediterranean Sea; Japan (Sakai, 1976a). Williams (1974a) reviews the distribution of this species and cites pertinent literature on the ship transport of crab larvae and their introduction into the Old World during recent times.

Depth: shore (intertidal) to 90 m (49 fm), more commonly to 35 m (19 fm).

Habitat: occurs in a wide range of salinities, from freshwater to hypersaline; along coasts in shallow water off ocean beaches (mainly females), in bays, estuaries, lagoons, ponds, ditches; well upstream in larger rivers (mainly males). Copeland and Bechtel (1974) listed an optimum salinity range of 0 to 27 ppt and optimum temperature range of 10 to 35°C, but extremes of 117 ppt (Hildebrand, 1957) and 45°C. (personal observations) under natural conditions are

tolerated for short periods. Mahood *et al.*, (1970) showed that temperature and salinity tolerances were interdependent. Blue crabs are also able to tolerate low oxygen conditions and they are occasionally found in very polluted and anoxic waters. Along the Texas coast, blue crabs in shallow ponds on sand flats are exposed to temperatures in excess of 40°C. during midday. These crabs have been observed to leave the water for *Salicornia* patches around the pools, where they rely on aerial respiration for 2 to 4 hours in the cooler (30 to 35°C.), humidity-saturated environment (personal observations). Blue crabs can travel some distance overland at night and during wet periods, again relying on aerial respiration.

Remarks: The vast literature, much of it non-technical or of a commercial nature, precludes anything approaching a complete bibliography on this species. The original type for this species was obtained from the eastern coast of the United States, a variant of the form that is more typical throughout its range. The "typical" form, most often encountered from Florida southward, was considered a subspecies by Rathbun (1930) and many others, *C. sapidus acutidens*, so-named because of the surface features and pronounced spines, teeth, and prominent ridges. Because the type-based form from farther north was the basis for comparison, confusion existed for some years over the designation of a type to replace the original, which had been lost. Williams (1974a) discusses these variations and the nomenclatural history of this crab, agreeing with Chace and Hobbs (1969) that a variety of extreme forms exist and that they could be considered separate species if they were considered in isolation from each other. However, these forms are intergraded and form a continuum, without morphological, bathymetrical, or geographical discontinuity, thus all the forms of *Callinectes sapidus* are considered, at present, to represent a single species in the process of local speciation which is still morphologically incomplete.

Recent literature compilations on this species were provided by Cronin *et al.* (1957) and by Tagatz and Hall (1971). Gulf regional lists include Florida (Wass, 1955; Tabb and Manning, 1961; Dragovich and Kelly, 1964; Rouse, 1970; Menzel, 1971; Lyons *et al.*, 1971), Mississippi (Richmond, 1962; Franks *et al.*, 1972; Christmas and Langley, 1973), Louisiana (Behre, 1950; Darnell, 1959; Hoese and Valentine, 1972), Texas (Gunter, 1950; Hedgpeth, 1950; Hoese, 1960; Copeland, 1965; Leary, 1967; More, 1969; Copeland and Bechtel, 1974), Mexico (Contreras, 1930; Hildebrand, 1957), and north coast of Cuba (Chace, 1940).

Hay (1905) and Churchill (1919) provided comprehensive life history studies. Other information on ecology includes: habitat relationships in Texas (Hedgpeth, 1953; Simmons, 1957; Breuer, 1962; Fotheringham and Brunenmeister, 1975; Trent, Pullen and Proctor, 1976), megalops ecology in Maryland (Cargo, 1960), habitat notes in Mississippi (Franks *et al.*, 1972; Christmas and Langley, 1973), effects of environmental variables on juveniles (Holland, Aldrich and Strawn, 1971), larval ecology in Virginia (Sandifer, 1973), seasonal population changes in Chesapeake Bight (Musick and McEachran, 1972), field observations of freshwater populations (Gunter, 1938), temperature and thermal tolerance (Tagatz, 1969a), and habitats in Jamaica (Norse, 1972).

Behavioral studies include: agonistic displays (Jachowski, 1974), larval shadow responses (Forward, 1977), analyses of swimming behavior (Spirito, 1972), predation on oyster spats (Lunz, 1947), quahogs (Carriker, 1951; Haven and Andrews, 1957), and gastropods (Hamilton, 1976), predator avoidance (Gunter, 1954), sex recognition (Teytaud, 1971), and climbing behavior on vegetation (Abbott, 1967).

Developmental studies include: larval rearing in the laboratory (Costlow and Bookhout, 1959, 1960a; Rust and Carlson, 1960; Davis, 1965), feeding of larvae (Sulkin and Epifanio, 1975), variability in morphology of larvae (Tyler and Cargo, 1963; Costlow, 1965), hormonal control of development (Costlow, 1963), zoeal growth and survival (Sandoz and Rogers, 1944), effects of pesticides on larval development (Bookhout and Costlow, 1976), salinity-temperature effects on larvae (Costlow, 1967; Rosenberg and Costlow, 1976), growth of juveniles (Gray and Newcombe, 1938; Tagatz, 1969b; Holland, Aldrich and Strawn, 1971), and development of cheliped laterality (Hamilton, Nishimoto and Halusky, 1976).

Physiological studies include: effects of salinity on growth at terminal molt (Haefner and Shuster, 1964), ionic and osmotic regulation (Gifford, 1962a; Tan and van Engel, 1966; Mantel, 1967; Copeland and Fitzjarrell, 1968; Ballard and Abbott, 1969; Tagatz, 1971; Gerard and Gilles, 1972; Mangum and Amende, 1972; Lynch *et al.*, 1973; Towles *et al.*, 1976; Mangum *et al.*, 1976; Mangum and Towle, 1977), respiration and respiratory pigments (Ayres, 1938; Gray, 1957; Horn and Kerr, 1963, 1969; Bonaventura *et al.*, 1974; Engel and Eggert, 1974; Mangum and Weiland, 1975; Weiland and Mangum, 1975; Lewis and Haefner, 1976; Laird and Haefner, 1976), hemolymph volume (Gleeson and Zubkoff, 1977), responses of megalops to pressure (Naylor and Isaac, 1973), gross anatomy and fine structure (Cochran, 1935; Cronin, 1947; Pyle and Cronin, 1950; Jahromi and Govind, 1976), ultrastructure of sperm (G. C. Brown, 1966), partial albinism (Sims and Joyce, 1966), neuroendocrinology (Costlow, 1963; Payen *et al.*, 1971; Andrews, Copeland and Fingerman, 1971; Skinner and Graham, 1972; Andrews, 1973; Ludolph, Paganalli and Mote, 1973), biochemical adaptations (Vernberg and Vernberg, 1968; Robert and Gray, 1972), neurobiology (Mendelson, 1963, 1966; Skobe and Nunnemacher, 1970; Hazlett, 1971; White and Spirito, 1973; Maynard and Dando, 1974; Reingold, 1975; Steinacker, 1975), fluoride metabolism (Moore, 1971), effects of DDT (Sheridan, 1975), homolymph coagulation (Morrison and Morrison, 1952), and temperature effects on growth and metabolism (Tagatz, 1969a; Leffler, 1972).

Studies on parasitology and pathology include: parasitic barnacles (Humes, 1941a; Reinhard, 1950a, 1950b; Adkins, 1972a), external barnacles (Williams and Porter, 1964), effects of nemerteans on reproduction (Hopkins, 1947), infections of nemerteans in gills (Pearse, 1949), amoebic infections (Sprague and Beckett, 1966; Sawyer, 1969; Sprague, Beckett and Sawyer, 1969; Pauley, Newman and Gould, 1975), effects of amoeba infections on hemocyte values (Sawyer, Cox and Higginbottom, 1970), gas-bubble disease (Johnson, 1976), microsporid infections (Sprague, 1965, 1966), bacterial infections (Krantz, Colwell and

Lovelace, 1969; Cook and Lofton, 1973), fungal infections (Couch, 1942; Newcombe and Rogers, 1947; Rogers-Talbert, 1948; Bland *et al.*, 1976) and trematode infections (Overstreet and Perry, 1972).

Commercial fishery and mariculture reports include: Texas fishery (Daugherty, 1952a; More, 1969), Louisiana fishery (Jaworski, 1970; Adkins, 1972b), Mississippi fishery (Perret, 1967; Perry, 1975), Chesapeake Bay fishery (Truitt, 1939; van Engel, 1958; Miller, Sulkin and Lippson, 1975), methods for handling soft crabs (Haefner and Garten, 1974), migration in bays and estauries (Fiedler, 1930), and mariculture (Rust and Carlson, 1960; Sulkin and Epifanio, 1975). The preceding does not include unpublished reports of state Fish and Game Commissions, which contain statistics on commercial landings and are further summarized by publications of the U.S. Fish and Wildlife Service.

Callinectes similis Williams, 1966 (Tulane Stud. Zool. 13: 87)

Common Name: Lesser Blue Crab

As ***C danae***—Rathbun, 1930, p. 118 (part).
As ***C. ornatus***—Hay & Shore, 1918, p. 433, pl. 34, fig. 2; Contreras, 1930, p. 231 (part), ? fig. 4; Rathbun, 1930, p. 114 (part); Williams, 1965, p. 172, fig. 152.
As ***C. similis***—Williams, 1966, p. 87, figs. 3, 4E–F; Felder, 1973a, p. 58, pl. 8, fig. 1; Williams, 1974a, p. 731, figs. 4, 18a (not 18b), 20c, 22a, 24.

Range: Delaware Bay to southern Florida; Florida Keys; northwest Florida to Campeche, Yucatan, including Gulf coast of United States and Mexico.

Depth: shore to 92 m (50 fm).

Habitat: in ocean waters, near shore on sand and mud bottoms, often in association with populations of *C. sapidus*; in bays and estuaries, rarely below salinities of 15 ppt (Hoese, 1960 lists a range of 4.7 to 45 ppt), most common at 25 to 37 ppt; temperature ranges of 13 to 29°C. in the Gulf, slightly higher in Texas bays.

Remarks: With the exception of southwest Florida, all Gulf coast records of *C. danae* and *C. ornatus* for the United States and Mexico should be referred to *C. similis*. Regional lists, including records under *danae* and *ornatus*, include Florida (Wass, 1955; Tagatz, 1967; Abele, 1970), Mississippi (Richmond, 1962; Franks *et al.*, 1972; Christmas and Langley, 1973), Louisiana (Behre, 1950; Dawson, 1966), Texas (Gunter, 1950; Daugherty, 1952b; Hildebrand, 1954; Simmons, 1957; Hoese, 1960; Breuer, 1962; Leary, 1967; Hoese *et al.*, 1968), and Campeche (Hildebrand, 1955). Nocturnal swimming at the surface was noted by Franks *et al.* (1972).

Cronius Stimpson, 1860

Cronius ruber (Lamarck, 1818) (Hist. Nat. Anim. sans Vert., vol. 5, p. 260)

Rathbun, 1930, p. 139, pls. 62–63; Rathbun, 1933, p. 51; Garth, 1965a, p. 15; Williams, 1965, p. 174, fig. 154; Felder, 1973a, p. 55, pl. 8, fig. 3.

Range: South Carolina to south Florida; Dry Tortugas; off Texas; off Campeche, Mexico; Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands to Dominica; Caribbean coast of Panama; Amapá to Santa Catarina, Brazil; in

eastern Atlantic—from Cape Verde Island and Senegal to Angola; in eastern Pacific—from Lower California (Mexico) to Peru; Galapagos Islands; Clipperton Island.

Depth: shallow water to 105 m (to 57 fm).

Habitat: sandy bottoms; from areas of reefs, rocks, and shell rubble.

Remarks: Listed from Texas by Leary (1967) and confirmed by Felder (1973a). Garth and Stephenson (1966) commented on Pacific distribution and African collections were examined by Forest and Guinot (1966). Listed from Brazil to a depth of 105 m by Coelho and Ramos (1972).

Cronius tumidulus (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 149)

Rathbun, 1930, p. 142, pl. 64; Rathbun, 1933, p. 51, fig. 43.

Range: Bermuda; Bahamas; Florida Keys and Dry Tortugas; west coast of Florida; north and south coasts of Cuba; Jamaica; Puerto Rico; Virgin Islands; Netherlands Antilles; Old Providence Island (Carib.); Ceará to Bahia, Brazil.

Depth: 5 to 73 m (3 to 40 fm).

Habitat: coral, sand, and rock bottoms; grass, seaweed, and *Sargassum*.

Remarks: Listed from Brazil by Coelho and Ramos, 1972.

Lupella Rathbun, 1897

Lupella forceps (Fabricius, 1793) (Entom. Syst. emend. auct., vol. 2, p. 449)

Rathbun, 1930, p. 133, pl. 57; Rathbun, 1933, p. 50, fig. 41.

Range: north coast of Cuba; Jamaica; Haiti; Puerto Rico; St. Thomas, Virgin Islands; Martinique.

Depth: 13 to 15 m (7 to 8.5 fm).

Habitat: mud bottoms.

Portunus Weber, 1795

(This genus has traditionally been divided into subgenera, based on morphological critera. Modern studies of *Portunus* (Stephenson and Rees, 1967; Stephenson, Williams, and Lance, 1968) have raised serious doubts about the subgeneric relationships and they suggest that further study will be necessary to define the complex phylogenetic affinities of this group, including the closely related genera, *Arenaeus* and *Callinectes*. As in Williams (1965), subgeneric catagories are deleted here.)

Portunus anceps (Saussure, 1858) (Mém. Soc. Phys. Hist. Nat. Geneve 14: 434)

Hay & Shore, 1918, p. 431, pl. 33, fig. 8; Rathbun, 1930, p. 42, pl. 15; Rathbun, 1933, p. 46; Williams, 1965, p. 163, fig. 145.

Range: North Carolina; Bermuda; Bahamas; Florida Keys; north and south coasts of Cuba; Caribbean coast of Yucatan; Jamaica; Puerto Rico; St. Thomas, Virgin Islands to Guadeloupe; Panama to Bahia, Brazil.

Depth: surface to 103 m (to 56 fm).

Habitat: mainly on sandy bottoms, often with weeds or grass; also on mud, shell, and stone substrates; on coral reefs; buries in sand; in shallow waters, brackish ponds.

Remarks: Rathbun (1930) reported ovigerous females from North Carolina in October and from Cuba in June. Listed from Brazil by Coelho (1971a) and by Coelho and Ramos (1972).

Portunus binoculus Holthuis, 1969 (Bull. Mar. Sci. 19: 409)

Holthuis, 1969, p. 409, fig. 1.

Range: Bahamas; Florida Straits; north coast of Cuba; east of Yucatan, in Caribbean Sea; off Caribbean coasts of Panama and Colombia.

Depth: 74 to 291 m (40 to 159 fm), possibly to a range of 63 to 467 m (34 to 255 fm).

Remarks: Holthuis (1969) notes that some of the specimens of *P. spinicarpus* in Rathbun (1930) may be *P. binoculus* and these may include a record from Tortugas at 37 m (20 fm).

Portunus depressifrons (Stimpson, 1859) (Ann. Lyc. Nat. Hist. New York 7: 58)

Hay & Shore, 1918, p. 430, pl. 33, fig. 7; Rathbun, 1930, p. 84, pl. 41; Rathbun, 1933, p. 47; Williams, 1965, p. 166, fig. 149.

Range: North Carolina; Bermuda; south Florida; Florida Keys and Dry Tortugas; Bahamas; Gulf of Campeche, off Yucatan; north coast of Cuba; Culebra; St. Thomas, Virgin Islands; Aruba, Netherlands Antilles; Old Providence Island (Carib.).

Depth: surface to 29 m (to 16 fm).

Habitat: shallow water coves and inlets with sandy bottoms; on coral, shell, and grass-covered sand substrates.

Remarks: Listed from northwest Florida by Wass (1955), Abele (1970), and Menzel (1971). Williams (1965) notes the lack of recent specimens from the Florida Keys. Ovigerous females have been reported from Florida in June and August, the Caribbean in August (Rathbun, 1930), and from Campeche in August (Williams, 1965). Chace (1956) recorded this species off the north coast of Yucatan. Abele (1970) provided detailed notes on the color of a live female and he listed it as common in St. Andrews Bay, Florida.

Portunus floridanus Rathbun, 1930 (Bull. U.S. Nat. Mus. 152: 82)

Rathbun, 1930, p. 82, pl. 40.

Range: Key West, Florida.

Depth: 82 m (45 fm).

Habitat: coral reefs.

Portunus gibbesii (Stimpson, 1859) (Ann. Lyc. Nat. Hist. New York 7: 57)

Hay & Shore, 1918, p. 428, pl. 33, fig. 1; Rathbun, 1930, p. 49, pls. 16–17; Williams, 1965, p. 164, fig. 146; Felder, 1973a, p. 60, pl. 8, fig. 16.

Range: Massachusetts to south Florida; Florida Keys and Straits; Dry Tor-

tugas; west coast of Florida to south Texas; Campeche, Mexico; Venezuela; Surinam.

Depth: surface to 88 m (to 48 fm), rarely deeper.

Habitat: mud, sand, and broken shell bottoms; usually in deeper off-shore waters of Gulf coast and in deeper parts of near-shore marine passes, inlets, and bays.

Remarks: Regional lists include Florida (Wass, 1955; Tabb and Manning, 1961; Rouse, 1970; Abele, 1970; Menzel, 1971), Mississippi (Richmond, 1968; Franks *et al.*, 1972; Christmas and Langley, 1973), Louisiana (Dawson, 1966; Hoese and Valentine, 1972), Texas (Gunter, 1950; Hildebrand, 1954; Parker, 1959; Leary, 1967), and from the Gulf (Chace, 1956; Fotheringham and Brunenmeister, 1975). Hildebrand (1954) reported this crab abundant at 6 to 10 fm at Campeche. Tabb and Manning (1961) found this crab feeding on concentrations of cyprinodont fishes in Coot Bay, Florida. Musick and McEachran (1972) listed it from Chesapeake Bight at depths of 18 to 49 m. Felder (1973a) notes that this species is often found in association with *P. spinimanus*. Rathbun (1930) reported ovigerous females from Florida in April; Williams (1965) cites other ovigerous females from North Carolina to Surinam, from February to June. Gray (1957) measured the gill area of this crab and compared it with habitat preferences.

Portunus ordwayi (Stimpson, 1860) (Ann. Lyc. Nat. Hist. New York 7: 224)

Hay & Shore, 1918, p. 431, pl. 33, fig. 6; Rathbun, 1930, p. 71, pl. 33; Rathbun, 1933, p. 46; Chace, 1940, p. 31; Williams, 1965, p. 166, fig. 148.

Range: Massachusetts; North Carolina; Bermuda; Bahamas; southeast Florida; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; north and south coasts of Cuba; Gulf and Caribbean coasts of Yucatan; Jamaica; Puerto Rico; St. Thomas, Virgin Islands to Dominica; Old Providence Island (Carib.); Pará and Fernando de Noronha to Bahia, Brazil.

Depth: surface to 106 m (58 fm), rarely deeper.

Habitat: sand, gravel, broken shell, and coral substrates.

Remarks: Rathbun (1930) listed an ovigerous female from Florida in March. Chace (1956) recorded this species from off northwest Florida. Listed from Brazil by Coelho (1971a), Coelho and Ramos (1972), and Fausto Filho (1974).

Portunus sayi (Gibbes, 1850) (Proc. Amer. Assoc. Adv. Sci., 3rd Meeting, 7: 178)

Common Name: Sargassum Crab

Hay & Shore, 1918, p. 428, pl. 33, fig. 2; Rathbun, 1930, p. 37, text-figs. 6–7, pl. 14; Rathbun, 1933, p. 45, fig. 39; Chace, 1940, p. 31; Williams, 1965, p. 163, fig. 144; Felder, 1973a, p. 59, pl. 8, fig. 12.

Range: Nova Scotia to south Florida; Bermuda; Bahamas; Florida Keys and Dry Tortugas; west coast of Florida to south Texas; north and south coasts of Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; Trinidad; Guiana; Brazil; in eastern Atlantic Ocean; off Kerguelon Island in the Indian Ocean.

Depth: pelagic, at surface.

Habitat: normally among *Sargassum*, floating on surface; also on other flotsam; occasionally swimming freely.

Remarks: Larval stages from Bermuda were described by Lebour (1944) and Coventry (1944) described Caribbean collections. Williams (1965) listed ovigerous females in the northeast Gulf and in the West Indies from February to August and from off Massachusetts in September. Regional lists include Florida (Abele, 1970), Mississippi (Franks *et al.*, 1972), Louisiana (Behre, 1950), Texas (Leary, 1967), and the Gulf (Chace, 1956; Fotheringham and Brunenmeister, 1975). Autotomy and regeneration of chelae was studied by Zeleny (1908); Hartnoll (1971) described swimming behavior.

Portunus sebae (H. Milne Edwards, 1834) (Hist. Nat. Crust., vol. 1, p. 455)

Rathbun, 1930, p. 79, pls. 34–35; Rathbun, 1933, p. 46.

Range: Bermuda; Florida Keys and Straits; Dry Tortugas; south coast of Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; Dominica; Netherlands Antilles.

Depth: 4 to 18 m (2 to 10 fm).

Habitat: sand, rocky, and grass-covered sandy bottoms.

Portunus spinicarpus (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 148)

Hay & Shore, 1918, p. 429, pl. 33, fig. 3; Rathbun, 1930, p. 92,, pl. 45; Rathbun, 1933, p. 47; Chace, 1940, p. 32; Williams, 1965, p. 167, fig. 150; Holthuis, 1969, p. 415, fig. 1; Felder, 1973a, p. 60, pl. 8, figs. 13–14.

Range: North and South Carolina; southeast Florida; Florida Keys and Dry Tortugas; west coast of Florida to south Texas; north and south coasts of Cuba; Puerto Rico; Trinidad; Caribbean coast of Colombia; Guianas to Santa Catarina, Brazil.

Depth: 9 to 550 m (5 to 300 fm).

Habitat: on sand, gravel, coral, broken shell, and mud substrates.

Remarks: Larval development was described by Bookhout and Costlow (1974). Williams (1965) listed ovigerous females from Texas in November. Rathbun (1930) noted that despite large numbers of this crab in the Florida Keys, fish stomachs do not contain this species, which she attributes to the Crab's extendable carpal spines. Pearse (1932a) reported the presence of the barnacle, *Dichelastis sinvata*, on crabs from North Carolina. Holthuis (1969) expanded the previously known depth range to 550 m and he reported ovigerous females from the Caribbean from January to September, with some females carrying sacculinid barnacles. Musick and McEachran (1972) collected this crab from a depth of 101 m in Chesapeake Bight. Regional lists included Florida (Hulings, 1961; Abele, 1970), Mississippi (Richmond, 1962; 1962; Franks *et al.*, 1972), Louisiana (Dawson, 1966), and Texas (Hildebrand, 1954; Chace, 1956; Leary, 1967). Listed from Brazil by Rodrigues da Costa (1968a), Coelho (1971a) and Coelho and Ramos (1972).

Portunus spinimanus Latreille, 1819 (Nouv. Dict. Hist. Nat., ed. 2, vol. 28, p. 47)

Hay & Shore, 1918, p. 429, pl. 33, fig. 4; Rathbun, 1930, p. 62, text-fig. 10, pls.

26–28; Rathbun, 1933, p. 46; Chace, 1940, p. 31; Williams, 1965, p. 165, fig. 147; Felder, 1973a, p. 59, pl. 8, fig. 15.

Range: New Jersey to south Florida; Bermuda; Bahamas; Florida Keys and Dry Tortugas; west Florida to south Texas; Campeche, off Mexico; south coast of Cuba; Jamaica; Puerto Rico; Hispaniola; Trinidad; Aruba, Netherlands Antilles; Bahia to Santa Catarina, Brazil.

Depth: surface to 91 m (50 fm).

Habitat: waters of inlets, canals, and harbors; on sand, gravel, broken shell, and mud bottoms; occasionally on *Sargassum*.

Remarks: Lebour (1950) raised and described larvae collected at Bermuda. Holthuis (1959) listed ovigerous females from Surinam in May, August, and September; Williams (1965) summarized other records of ovigerous females. Regional lists include Florida (Wass, 1955; Tabb and Manning, 1961; Abele, 1970; Menzel, 1971), Mississippi (Richmond, 1962), Louisiana (Behre, 1950), Texas (Hildebrand, 1954; Parker, 1959; Leary, 1967), and Campeche (Hildebrand, 1954). This crab was abundant at Campeche at depths of 6 to 10 fm, often in association with *P. gibbesii*. Reported from the Gulf by Chace (1956) and described generally by Fotheringham and Brunenmeister (1975). Musick and McEachran (1972) found this crab at 49 m depth in Chesapeake Bight. Gray (1957) measured gill area. Lobo de Mesquita (1972) reported biometrical data on Brazilian specimens; listed from Brazil by Coelho and Ramos (1972).

Portunus ventralis (A. Milne Edwards, 1879) (Crust. Rég. Mex., p. 215)

Rathbun, 1930, p. 43, pl. 13, figs. 1–2; Rathbun, 1933, p. 46; Chace, 1940, p. 31; Felder, 1973a, p. 59, pl. 8, fig. 11.

Range: Georgia to east coast of Florida; Dry Tortugas; ? Texas; north and west coasts of Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; Barbados; Rio Grande do Norte to Rio de Janeiro, Brazil.

Depth: shallow water, near shore, to 25 m (14 fm).

Habitat: sandy beaches; tide pools; on surface of open waters.

Remarks: Felder (1973a) questioned reports by Parker (1959) and Trott (unpublished) of this crab's occurrence in Texas; these records have not been verified by later collections. Rathbun (1930) reported ovigerous females from Dry Tortugas in August. Listed from Brazil by Coelho and Ramos (1972).

Portunus vocans (A. Milne Edwards, 1878) (Bull. Soc. Philom. Paris, ser. 7, vol. 2, p. 225)

Rathbun, 1930, p. 60, text-figs. 8–9, pl. 25.

Range: north coast of Cuba; between Jamaica and Haiti; Ascension Island, in the South Atlantic Ocean.

Depth: 37 to 309 m (20 to 169 fm).

Habitat: coral and broken shell bottoms.

Superfamily XANTHOIDEA Dana, 1851

Family POTAMIDAE Ortmann, 1896

The Freshwater Crabs

The familial name, based on the genus *Potamon* Savigny, 1816, was corrected from the original Potamonidae of Ortmann by an ICZN decision (Opinion 712, p. 342, in 1964). A revision of the freshwater crabs by Bott (1955b) split this family into two: the Pseudothelphusidae and the Trichodactylidae. Various other schemes for classification have been proposed (Pretzmann, 1965; Bott, 1968; Smalley, 1970). Gulf region species are confined to northern Cuba and southern Mexico, but insufficient material and information is available for most species to yield accurate ranges or to present a satisfactory organization of taxonomic relationships. Because these crabs are inhabitants of rivers, lakes, and caves, species ranges tend to be restricted to small areas; several are known only from a single type specimen. Species occurring in the center of a land mass, such as *Potamocarcinus (Typhlopseudothelphusa) mocinoi* in caves near Comitan (Chiapas) Mexico (Rioja, 1952) could be assigned to a coastal region based on watershed drainage patterns. The Cuban species listed by Chace and Hobbs (1969) are not localized to either the Gulf or the Caribbean side of the island in the records cited. For these reasons, these crabs are not included in the present work. Further references, including some older systematic papers, can be found in the papers cited above. There exists a clear need for more extensive work on this group of brachyurans.

Family XANTHIDAE Dana, 1851

This is a large family of crabs (about 1000 species and more than 130 genera) that has traditionally posed a number of taxonomic problems. Many of the species are small in size and appear morphologically similar. Individual variability and the large number of closely related species has often made definitive identification difficult, so that earlier collection records must be used cautiously. Rathbun (1930) did not subdivide her account of the xanthids into subfamilies. Guinot (1971) offers a number of systematic revisions and she comments at some length on affinities, but she also avoids listing the 51 genera that she treats under subfamilies. The same procedure is followed here, by arrangement of the 33 Gulf genera in alphabetical order, without regard for proposed affinity within the family. The xanthids are currently being revised by various workers around the world, so that a better organized and more accurate representation of this family should be forthcoming.

Actaea de Haan, 1833

Actaea acantha (H. Milne Edwards, 1834) (Hist. Nat. Crust., vol. 1, p. 379)
Rathbun, 1930, p. 261, pl. 105, fig. 5, pl. 106, figs. 1–2; Rathbun, 1933, p. 57.

Range: Bahamas; Florida Keys and Dry Tortugas; northwest coast of Cuba; Jamaica; Haiti; Puerto Rico; Guadeloupe; St. Bartholomew; Fernando de Noronha, Brazil.

Depth: surface to 22 m (to 12 fm).

Habitat: sand, shell, coral bottoms; from coral reefs; off mud and grassy bottoms.

Remarks: Habitat and color of specimens from Brazil were described by Fausto Filho (1974).

Actaea bifrons Rathbun, 1898 (Bull. Lab. Nat. Hist. State Univ. Iowa 4: 262)

Rathbun, 1930, p. 255, text-fig. 41, pl. 104, figs. 3–6; Rathbun, 1933, p. 56, fig. 48.

Range: Key West, Florida; Puerto Rico; Virgin Islands; St. Bartholomew; Barbados; Curaçao; Colon, Panama.

Depth: 18 to 73 m (10 to 40 fm).

Habitat: in coral, *Porites furcata*; on shoal banks, coral bottoms, sponge areas.

Actaea palmeri Rathbun, 1894 (Proc. U.S. Nat. Mus. 17: 85)

Rathbun, 1930, p. 260, pl. 106, figs. 3–6; Rathbun, 1933, p. 56.

Range: Bahamas; east coast of Florida; Florida Keys; north coast of Cuba; Haiti; Virgin Islands; Curaçao.

Depth: shallow water to 145 m (to 78 fm).

Habitat: from sponges and among coral (*Porites furcata*).

Actaea rufopunctata nodosa Stimpson, 1860.

Transferred to a new genus, *Paractaea*, by Guinot (1969b). See *Paractaea rufopunctata nodosa* (Stimpson, 1860).

Actaea setigera (H. Milne Edwards, 1834).

Transferred to a new genus, *Platyactaea*, by Guinot (1967b). See *Platyactaea setigera* (H. Milne Edwards, 1834).

Carpilius Leach, 1823

Carpilius corallinus (Herbst, 1783) (Natur. Krabben u. Krebse, vol. 1, p. 133)

Common Names: Queen Crab; Coral Crab

Rathbun, 1930, p. 240, pls. 97–99; Rathbun, 1933, p. 53; Chace, 1940, p. 33; Guinot, 1968b, p. 157, fig. 9; Guinot, 1968c, p. 321, figs. 10–11; Pequegnat & Ray, 1974, p. 237, figs. 13–15.

Range: Bermuda; Bahamas; West Flower Garden Bank, off Texas; north coast of Cuba; Jamaica; Puerto Rico; Virgin Islands; Guadeloupe; Dominica; Curaçao; Old Providence Island (Carib.); Pernambuco and Ceará, Brazil.

Depth: 2 to 46 m (1 to 25 fm).

Habitat: on coral reefs; sandy, coral, and stone substrates.

Remarks: This is the largest crab found in the Gulf of Mexico and Caribbean area and it is used for food in the West Indies. It reaches carapace widths of more than 15 cm. Garth (1965a) compared this species with *C. convexus* from the Pacific. Pequegnat and Ray (1974) reported some observations on mating and other behavior seen on a coral reef off the Texas coast. Saraiva da Costa (1968) described the biology and fishery of this species at Ceará, Brazil. Listed from Brazil by Fausto Filho (1968).

Carpoporus Stimpson, 1871

Carpoporus papulosus Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 139)

Rathbun, 1930, p. 269, pl. 110, figs. 3–6, pl. 111; Williams, 1965, p. 186, figs. 168, 183B; Guinot, 1967b, p. 551, figs. 18–19, 22.

Range: North Carolina; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; Alabama; north of Yucatan, Mexico.

Depth: 33 to 110 m (18 to 60 fm).

Habitat: sand, broken shell, and coral bottoms.

Remarks: Wass (1955) listed this species from northwest Florida.

Cataleptodius Guinot, 1968

Cataleptodius floridanus (Gibbes, 1850) (Proc. Amer. Assoc. Adv. Sci. 3: 175)

As ***Leptodius floridanus***—Rathbun, 1930, p. 297, pl. 137, figs. 1–2, pl. 138, fig. 1; Rathbun, 1933, p. 57.

As ***Cataleptodius floridanus***—Guinot, 1968a, p. 706, figs. 20, 23, 29.

Range: Bermuda; Bahamas; Florida Keys and Dry Tortugas; northwest coast of Florida; north coast of Cuba; Jamaica; Puerto Rico; Virgin Islands; Antigua; Barbados; Curaçao; Panama to Colombia (Caribbean coasts; Abolhos Islands to São Paulo, Brazil.

Depth: shallow water to 33 m (to 18 fm).

Habitat: on coral and stone reefs; in *Sargassum*; in living sponges; from sand, shell, grassy, mud bottoms; intertidal pools in rocky areas; under rocks.

Remarks: Menzel (1971) listed this crab as rare on oyster reefs at Apalachee Bay, Florida. Listed from Florida by Abele (1970). Sulkin (1973) described larval depth regulation and Epifanio (1972) studied the effects of dieldrin on larval development. Hazlett (1976) described agonistic behavior in this crab. Listed from Brazil by Fausto Filho (1974), he provided notes on color of crab and its habitat.

Chlorodiella Rathbun, 1897

Chlorodiella longimana (H. Milne Edwards, 1834) (Hist. Nat. Crust., vol. 1, p. 401)

Rathbun, 1930, p. 462, pl. 186; Rathbun, 1933, p. 68, fig. 58.

Range: Bahamas; east coast of Florida; Florida Keys and Dry Tortugas; Jamaica; Puerto Rico; Virgin Islands; Martinique; Barbados; Curaçao.

Depth: 5 to 154 m (3 to 84 fm).

Habitat: coral reefs; rock and stone substrates; in sponges.

Remarks: Rathbun (1930) also listed this species from West Africa.

Domecia Eydoux & Souleyet, 1842

Domecia acanthophora acanthophora (Desbonne & Schramm, 1867) (Crust. Guadeloupe, p. 35)

As ***D. hispida***—Rathbun, 1930, p. 554, pl. 227; Pequegnat & Ray, 1974, p. 237, figs. 16–17.

As ***D. acanthophora acanthophora***—Guinot, 1964, p. 271, figs. 4–5, 7–8, 15; Williams, McCloskey & Gray, 1968, p. 52.

Range: North and South Carolina; east coast of Florida; Florida Keys and Dry Tortugas; West Flower Garden Bank, off Texas; Cuba; Jamaica; Puerto Rico; Barbados; Curaçao; Alagoas to Pernambuco, Brazil.

Depth: low tide mark to 146 m (to 80 fm).

Habitat: on coral reefs; among sponges; rocky and coral bottoms.

Remarks: The Pacific specimens of *D. hispida* listed by Rathbun (1930) remain with the species indicated; the Atlantic specimens were referred by Guinot (1964) to *D. acanthophora*. Patton (1967) studied the ecology of this species on coral reefs (*Acropora*) off Puerto Rico. A single male was taken from *Oculina* off North Carolina by Williams, McCloskey and Gray (1968).

Domecia hispida Eydoux & Souleyet, 1842.

Atlantic specimens were referred to *D. acanthophora* (Desbonne & Schramm, 1867) by Guinot (1964).

Eriphia Latreille, 1817

Eriphia gonagra (Fabricius, 1781) (Species Insectorum, p. 505)

Common Name: Calico Crab

Hay & Shore, 1918, p. 439, pl. 35, fig. 6; Rathbun, 1930, p. 545, text-fig. 83, pl. 222; Rathbun, 1933, p. 75, fig. 64; Williams, 1965, p. 182, figs. 164A–C, 165; Felder, 1973a, p. 64, pl. 9, fig. 5.

Range: North Carolina; Bermuda; Bahamas; Florida Keys and Dry Tortugas; south Texas; north coast of Cuba; Jamaica; Puerto Rico; Virgin Islands; Antigua; Barbados; Trinidad; Aruba, Netherlands Antilles; Caribbean coasts of Panama and Colombia; Parahyba, Brazil to Argentina.

Depth: intertidal to shallow water subtidal.

Habitat: coral and stone reefs; under rocks and in crevices of intertidal pools; on rock jetties; brackish ponds; in seaweed and sponges.

Remarks: Ovigerous females are known from south Florida and the West Indies during March to September (Williams, 1965). Furtado-Ogawa (1972) noted habitats in Brazil.

Etisus H. Milne Edwards, 1834

Etisus maculatus (Stimpson, 1860) (Ann. Lyc. Nat. Hist. New York 7: 210)

As ***Phymodius maculatus***—Rathbun, 1930, p. 295, pl. 136; Rathbun, 1933, p. 57, fig. 49.

As ***Etisus maculatus***—Guinot, 1969b, p. 234.

Range: Florida Keys and Dry Tortugas; Bahamas; north coast of Cuba; Puerto Rico; Virgin Islands.

Depth: low tide mark and shallow water.

Habitat: coral reefs; among rocks.

Remarks: In transferring this species to *Etisus*, Guinot (1969b) remarks that

it becomes the sole representative of this genus in the Atlantic, other members of the genus being Indo-Pacific.

Eucratodes A. Milne Edwards, 1880

Eucratodes agassizii A. Milne Edwards, 1880 (Crust. Rég. Mex., p. 347)

Rathbun, 1930, p. 471, pl. 190; Rathbun, 1933, p. 68, fig. 59; Guinot, 1969a, p. 722, figs. 145–146; Pequegnat, 1970, p. 188.

Range: off Mississippi; Yucatan Channel (Caribbean); Puerto Rico.

Depth: 156 to 315 m (85 to 172 fm).

Habitat: mud, sand, and shell bottoms.

Remarks: Pequegnat (1970) collected an ovigerous female from 100 fm off Mississippi in early December.

Eurypanopeus A. Milne Edwards, 1880

Eurypanopeus abbreviatus abbreviatus (Stimpson, 1860) (Ann. Lyc. Nat. Hist. New York 7: 211)

Rathbun, 1930, p. 405, text-fig. 63, pl. 172, figs. 1–2; Rathbun, 1933, p. 64, fig. 55; Williams, 1965, p. 194, figs. 178, 183K; Felder, 1973a, p. 68, pl. 9, fig. 13.

Range: South Carolina; Bahamas; Florida Keys; ? Louisiana; Texas; Jamaica; Haiti; Puerto Rico; Virgin Islands; Antigua; Barbados; Curaçao; Trinidad; Colombia to Venezuela; Parahyba to Santa Catarina, Brazil.

Depth: intertidal to shallow subtidal.

Habitat: under rocks; on stone and coral reefs; under sponges and bryozoans; on oyster beds.

Remarks: Behre (1950) listed a specimen of *E. crenatus* from Grand Isle, Louisiana. Felder (1973a) notes that *E. crenatus* is known primarily from the Pacific coast of South America and that Behre's record may be a mistaken identification of *E. abbreviatus*. Williams (1965) listed ovigerous females from the West Indies during April to November and in southern Brazil from August to November. Furtado-Ogawa (1972) commented on ecology of this species in Brazil.

Eurypanopeus abbreviatus ater Rathbun, 1930 (Bull. U.S. Nat. Mus. 152: 407)

Rathbun, 1930, p. 407, pl. 172, figs. 3–4.

Range: Vera Cruz, Mexico.

Remarks: Known only from the single male type specimen; no other data available.

Eurypanopeus depressus (Smith, 1869) (Proc. Boston Soc. Nat. Hist. 12: 283)

Hay & Shore, 1918, p. 437, pl. 34, fig. 4; Rathbun, 1930, p. 410, text-fig. 65, pl. 173, figs. 3–4; Williams, 1965, p. 195, figs. 179, 183L; Felder, 1973a, p. 67, pl. 9, fig. 17.

Range: Massachusetts to south Florida; Bermuda; west coast of Florida to Texas; St. Martin, Leeward Islands.

Depth: intertidal to 48 m (to 26 fm).

Habitat: very common on oyster bars; on muddy and stony shores, usually intertidal; on wharves and submerged pilings; in eel grass; brackish waters, to 4.5 ppt salinity.

Remarks: Developmental studies include descriptions of larval stages (Costlow and Bookhout, 1961b) and data on larval ecology in Chesapeake Bight (Sandifer, 1973). Life history information was provided by Ryan (1956). Hyman (1925) figured zoeal stages. Lunz (1937) observed the association of this crab with oysters; McDermott (1960) noted the threat to oyster spats in New Jersey. Abele (1970) noted that the presence of the red spot on the third maxillipeds was not consistent among specimens, but is found in crabs only associated with oysters. Records of ovigerous females are summarized in Williams (1965). Regional lists include Florida (Wass, 1955; Tabb and Manning, 1961; Dragovich and Kelly, 1964; Abele, 1970; Lyons *et al.*, 1971; Menzel, 1971), Mississippi (Christmas and Langley, 1973), Louisiana (Behre, 1950), Texas (Leary, 1967), and the northwestern Gulf of Mexico (Fotheringham and Brunenmeister, 1975). Ayres (1938) studied respiration in relation to habitat preferences.

Eurypanopeus dissimilis (Benedict & Rathbun, 1891) (Proc. U.S. Nat. Mus. 14: 366)

Rathbun, 1930, p. 411, text-fig. 66, pl. 173, figs. 1–2.

Range: west coast of Florida; north coast of Cuba; Jamaica; Nicaragua; Trinidad; Brazil.

Habitat: Listed from a salt water lagoon in Nicaragua and from harbors in Florida and Jamaica, no depths given.

Eurypanopeus turgidus (Rathbun, 1930).

This is a manuscript name used by Abele (1970) for *Panopeus turgidus* Rathbun, 1930 and listed by Menzel (1971, p. 80) for northwest Florida. Dr. Fenner A. Chace, Jr. examined the identification of Abele's specimens and compared them with species of *Eurypanopeus*. Until official revision of the two genera is complete, the present work will continue to recognize this species as a member of the genus *Panopeus*, while recognizing its probable affinity with *Eurypanopeus*. See *Panopeus turgidus*.

Eurytium Stimpson, 1859

Eurytium limosum (Say, 1818) (J. Acad. Nat. Sci., Philadelphia 1: 446)

Hay & Shore, 1918, p. 438, pl. 35, fig. 7; Rathbun, 1930, p. 423, pl. 176, figs. 1–2; Rathbun, 1933, p. 65, fig. 56; Chace, 1940, p. 34; Williams, 1965, p. 199, figs. 182, 183O; Chace & Hobbs, 1969, p. 153, figs. 45, 46b; Felder, 1973a, p. 65, pl. 9, fig. 4.

Range: Bermuda; Bahamas; New York to south Florida; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; Louisiana; north and south coasts of Cuba; Jamaica; Hispaniola; Puerto Rico; Virgin Islands; Islas Los Roques; Curaçao; Belize; Caribbean coast of Panama; Maranhão to São Paulo, Brazil.

Depth: intertidal to shallow subtidal, near shore.

Habitat: muddy shores, especially among mangroves; burrows along tidal stream banks, burrows partially filled with water; under stones at high tide mark.

Remarks: Williams (1965) notes that modern records limit the northern extent of the range to South Carolina. Regional lists include Florida (Wass, 1955; Tabb and Manning, 1961; Abele, 1970; Menzel, 1971; Subrahmanyam *et al.*, 1976), and Louisiana (Behre, 1950; Hoese and Valentine, 1972). Manning (1961) compared growth of this crab with that in *Menippe mercenaria* and *Panopeus herbstii*. Warner (1969) provided ecological data on this species in Jamaica and Ryan (1956) described the life history of populations observed in Chesapeake Bay. Teal (1959) studied respiration of this crab under different field conditions.

Glyptoxanthosus A. Milne Edwards, 1879

Glyptoxanthosus erosus (Stimpson, 1859) (Ann. Lyc. Nat. Hist. New York 7:51)

Rathbun, 1930, p. 263, pl. 107; Williams, 1965, p. 185, figs. 167, 183A; Guinot, 1967b, p. 551, fig. 30; Felder, 1973a, p. 60, pl. 9, fig. 9.

Range: Bahamas; North Carolina; east coast of Florida; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; Louisiana and Texas (uncommon); Campeche Banks and off Yucatan, Mexico; Guadeloupe.

Depth: low tide mark to 68 m (to 37 fm).

Habitat: sand, broken shell, coral, and rock bottoms; from rocks and algal mats (*Halimeda*) in shallow water; sponges and coral reefs of deeper water.

Remarks: Ovigerous females are known from off northwest Florida in January (Williams, 1965). Listed from Florida by Wass (1955) and Chace (1956), from Louisiana by Behre (1950), and from Texas by Leary (1967).

Heteractaea Lockington, 1877

Heteractaea ceratopus (Stimpson, 1860) (Ann. Lyc. Nat. Hist. New York 7: 215)

Rathbun, 1930, p. 530, pl. 212, figs. 5–8; pl. 213; Guinot, 1968a, p. 721, figs. 50, 56.

Range: Bahamas; east coast of Florida; Florida Keys and Dry Tortugas; north coast of Cuba; Curaçao; Trinidad; Barbados.

Depth: shallow water.

Habitat: on coral reefs; in sponges and coral.

Hexapanopeus Rathbun, 1898

Hexapanopeus angustifrons (Benedict & Rathbun, 1891) (Proc. U.S. Nat. Mus. 14: 373)

Hay & Shore, 1918, p. 436, pl. 34, fig. 7; Rathbun, 1930, p. 384, text-fig. 60, pl. 169, figs. 1–2; Williams, 1965, p. 188, figs. 170, 183D; Felder, 1973a, pl. 9, fig. 24.

Range: Massachusetts to South Carolina; Bahamas; west and northwest coasts of Florida; Mississippi to Texas; Jamaica.

Depth: near shore subtidal to 139 m (to 76 fm).

Habitat: most commonly on muddy bottoms; occasionally on sand, shell, and gravel substrates; on oyster beds.

Remarks: Developmental studies include data on growth conditions for zoeal stages (Chamberlain, 1961), descriptions of larval stages as reared in the laboratory (Costlow and Bookhout, 1966a), and notes on larval ecology in Chesapeake Bight (Sandifer, 1973). Williams (1965) summarized records of ovigerous females. Ryan (1956) described the general life history of this crab in Chesapeake Bay. Hazlett (1976) studied agonistic behaviors. Regional lists include Florida (Wass, 1955; Dragovich and Kelly, 1964; Abele, 1970; Menzel, 1971; Lyons *et al.*, 1971), Louisiana (Behre, 1950), and Texas (Hedgpeth, 1953; Leary, 1967).

Hexapanopeus hemphillii (Benedict & Rathbun, 1891) (Proc. U.S. Nat. Mus. 14: 374)

Rathbun, 1930, p. 400, pl. 171, figs. 1–2, 6; Rathbun, 1933, p. 63.

Range: Florida Keys and Dry Tortugas; west coast of Florida; north coast of Cuba; Puerto Rico; St. Thomas, Virgin Islands.

Depth: low tide mark to 9 m (to 5 fm).

Habitat: coral, sand, and gravel bottoms; off turtle grass flats.

Hexapanopeus lobipes (A. Milne Edwards, 1880) (Crust. Rég. Mex., p. 331)

As ***Lophopanopeus lobipes***—Rathbun, 1930, p. 329, text-fig. 50, pl. 155, figs. 3–5.
As ***Hexapanopeus lobipes***—Menzies, 1948, p. 23.

Range: Bahamas; off Key West, in Florida Straits; northwest of Dry Tortugas.

Depth: 68 m (37 fm); also recorded from shallow water.

Habitat: sand bottoms; coral banks.

Remarks: Menzies (1948) noted that this species did not fit the generic description of *Lophopanopeus* and he transferred it to *Hexapanopeus*, the American genus it most closely resembled.

Hexapanopeus paulensis Rathbun, 1930 (Bull. U.S. Nat. Mus. 152: 395)

Rathbun, 1930, p. 395, pl. 170, figs. 5–6; Williams, 1965, p. 189, figs. 171, 183E; Felder, 1973a, p. 70, pl. 9, fig. 23.

Range: South Carolina; northwest Florida; Texas; São Paulo, Brazil.

Depth: intertidal to 5 m (3 fm).

Habitat: sand, broken shell, and rock substrates; off rock jetties; among sponges, ascidians, and bryozoans.

Remarks: Originally listed from South Carolina by Lunz (1937). Additional records, from northwest Florida, were provided by Abele (1970), including ovigerous females taken in July.

Hexapanopeus quinquedentatus Rathbun, 1901 (Bull. U.S. Fish Comm. for 1900, 2: 31)

Rathbun, 1930, p. 402, text-fig. 62.

Range: northwest Florida; Puerto Rico.

Depth: 15 to 22 m (8.5 to 12 fm).

Habitat: coral sand, sand-grass, rocky, and sticky mud bottoms.

Remarks: Rathbun (1930) noted the resemblance between this species and *H. sinaloensis*, a rare species from the west coast of Mexico. Abele (1970) provided the first Gulf records and noted a close resemblance to *H. paulensis*. Abele (1970) states that Fenner Chace, Jr., of the U.S.N.M. compared the Floridian specimens with the Puerto Rico holotype and noted the differences between them. The paucity of specimens of these three similar forms only permits a tentative designation of this crab; until further material and revision is available, this list follows the nomenclature of Abele (1970, p. 78).

Leptodius A. Milne Edwards, 1863

Leptodius agassizzi A. Milne Edwards, 1880.

Transferred to a new genus by Guinot (1968a), see *Pseudomedaeus agassizii*.

Leptodius floridanus (Gibbes, 1850).

Transferred to a new genus by Guinot (1968a), see *Cataleptodius floridanus*.

Leptodius parvulus (Fabricius, 1793) (Entom. Syst. Auct. et emend., vol. 2, p. 451) novo comb. Rathbun, 1930 (Bull. U.S. Nat. Mus. 152:305)

Rathbun, 1930, p. 305, pl. 141, figs. 1–3; Rathbun, 1933, p. 58, fig. 50.

Range: Bermuda; Bahamas; Florida Keys; Jamaica; Haiti; Puerto Rico; Barbados; Curaçao; Fernando de Noronha, Brazil.

Habitat: shallow water, near shore; under rocks; in tide pools.

Remarks: Fausto Filho (1974) provided notes on color and habitat of Brazilian specimens.

Lobopilumnus A. Milne Edwards, 1880

Lobopilumnus agassizii (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 142)

Hay & Shore, 1918, p. 441, pl. 34, fig. 5; Rathbun, 1930, p. 526, pl. 211, figs. 1–5; Williams, 1965, p. 181, figs. 157G, 163.

Range: Bermuda; North Carolina; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; north of Yucatan; north coast of Cuba; Trinidad.

Depth: low tide mark to 51 m (to 28 fm).

Habitat: sand, gravel, rock, coral, and broken shell substrates; under stones and dead corals; in sponges.

Remarks: Four environmental forms of this highly variable crab were recognized by Rathbun (1930): *L. a. typica*, *L. a. bermudensis*, *L. a. pulchella*, and *L. a. trinidadensis*. The distributions of the various forms overlap to some extent. Verrill (1908) described this species in Bermuda. Reported from the northeast Gulf by Chace (1956) and listed from northwest Florida by Abele (1970). Ovigerous females are known from Florida and Cuba during February to July (Williams, 1965). Pearse (1934) noted the presence of this crab inside the loggerhead sponge, *Spheciospongia vesparia*.

Lophopanopeus Rathbun, 1898

Lophopanopeus distinctus Rathbun, 1898.

Transferred to the genus *Micropanope* by Menzies (1948), see *Micropanope distincta* (Rathbun, 1898).

Lophopanopeus lobipes (A. Milne Edwards, 1880).

Transferred to the genus *Hexapanopeus* by Menzies (1948), see *Hexapanopeus lobipes* (A. Milne Edwards, 1880).

Melybia Stimpson, 1871

Melybia thalamita Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 144)

Rathbun, 1930, p. 562, pl. 230.

Range: Dry Tortugas; north coast of Cuba; Jamaica; Haiti; Culebra and Vieques Islands; Barbados; Curaçao; Colon, Panama; Abrolhos Islands, Brazil.

Depth: low tide mark to 368 m (to 201 fm), most common to 82 m (45 fm).

Habitat: coral, sand, rock, and broken shell bottoms.

Remarks: The deepest recorded specimens (192 and 201 fm) are from off Havana, Cuba.

Menippe de Haan, 1833

Menippe mercenaria (Say, 1818) (J. Acad. Nat. Sci. Philadelphia 1: 448)
Common Name: Stone Crab

Hay & Shore, 1918, p. 439, pl. 35, fig. 8; Rathbun, 1930, p. 472, text-fig. 78, pls. 191–193; Williams, 1965, p. 183, figs. 164D–E, 166; Felder, 1973a, p. 64, pl. 9, figs. 2–3.

Range: North Carolina to south Florida; Bahamas; Florida Keys; southwest Florida to south Texas; off Yucatan Gulf coast; north coast of Cuba; Jamaica.

Depth: surface and intertidal to 51 m (to 28 fm).

Habitat: in estuaries and bays of near-marine salinity; from sand, shell, clay, and mud substrates; in deeper waters on offshore reefs; in turtle grass (*Thalassia*) beds off northwest Florida; post-larval crabs are common in deeper channels and bays, under shell fragments; older juveniles and adults are among rocks, under stones, and on and among oyster bars.

Remarks: Except for the blue crab (*Callinectes sapidus*), this species is the most important crab commercially harvested on the Gulf coast, primarily in Florida. Williams (1965) summarizes much of the literature and accounts of the natural history of stone crabs in Texas are provided by Powell and Gunter (1968) and by Futch (1966) for Florida populations. Fotheringham and Brunenmeister (1975) offer general comments on the stone crab in the northwestern Gulf.

Developmental studies include data on fertilization (Binford, 1913), zoeal stage descriptions (Porter, 1960), studies of effects of temperature and salinity on larvae (Ong and Costlow, 1970), effects of Mirex on larvae (Bookhout *et al.*, 1972), and studies of larval energy budgets (Mootz and Epifanio, 1974). Studies

of behavior include those on mating (Hartnoll, 1969; Savage, 1971b), stridulation (Guinot-Dumortier and Dumortier, 1960), and shadow responses of larvae (Forward, 1977). Physiological research includes data on hormonal control of reproduction (Cheung, 1967, 1969), respiration in relation to habitat (Ayres, 1938), gill area measurements (Gray, 1957), respiration and metabolism (Leffler, 1973), respiration and osmoregulation (Karandieva and Lee, 1967), and digestion and energy balance (Suchenia and Claro Madruga, 1967).

Information on growth, molting, and fisheries includes reports by Manning (1961), Savage and McMahan (1968), Savage (1971a), and Savage, Sullivan and Kalman (1974, 1975). Cheung (1973, 1976) studied regeneration of claws in relation to molting. Menzel and Hopkins (1956) described predation of stone crabs on oysters in Louisiana. Iversen and Beardsley (1976) studied shell disease in south Florida populations. Humes (1941a) noted the presence of a parasitic barnacle.

Regional lists include Florida (Wass, 1955; Tabb and Manning, 1961; Dragovich and Kelly, 1964; Abele, 1970; Menzel, 1971; Lyons *et al.*, 1971), Mississippi (Richmond, 1962; Franks *et al.*, 1972; Christmas and Langley, 1973), Louisiana (Behre, 1950; Hoese and Valentine, 1972), Texas (Gunter, 1950; Whitten, Rosene and Hedgpeth, 1950; Hedgpeth, 1953; Hildebrand, 1954; Simmons, 1957; Parker, 1959; Hoese, 1960; Leary, 1967), and the northeastern Gulf (Chace, 1956).

Menippe nodifrons Stimpson, 1859 (Ann. Lyc. Nat. Hist. New York 7: 53)

Rathbun, 1930, p. 479, pl. 198, fig. 3, pl. 199.

Range: east coast of Florida; ? Louisiana; north and south coasts of Cuba; Jamaica; Virgin Islands; Trinidad; Caribbean coasts of Panama and Colombia; Paraiba to São Francisco do Sul, Brazil; Gabon, West Africa.

Depth: shallow water, near shore.

Habitat: tide pools; under rocks; near dock pilings; on sponges and among bryozoans.

Remarks: Rathbun's (1930) record of this crab from Louisiana has been questioned by Felder (1973a) because extensive collecting along the northwestern Gulf coast has produced no further specimens. The only other Gulf record would be that of a single male collected near Havana, Cuba (Rathbun, 1930).

Micropanope Stimpson, 1871

(As restricted by Guinot (1967a, 1968b), this genus would include only the type species, *M. sculptipes* Stimpson, and one other, leaving a number of species formerly in *Micropanope* without an apparent generic name. Following a suggestion of Garth (pers. comm.), this list retains these orphaned species, not included in other genera by Guinot, as members of *Micropanope*, pending further clarification of their taxonomic status.)

Micropanope barbadensis (Rathbun, 1921) (Bull. Lab. Nat. Hist. State Univ. Iowa 9: 73), novo comb. Rathbun, 1930 (Bull. U.S. Nat. Mus. 152: 446)

Rathbun, 1930, p. 446, text-fig. 72.

Range: Dry Tortugas; Barbados.
Depth: shallow water.
Habitat: from coral heads.

Micropanope distincta (Rathbun, 1898) (Bull. Lab. Nat. Hist. State Univ. Iowa 4: 272)

As ***Lophopanopeus distinctus***—Rathbun, 1930, p. 331, pl. 155, figs. 1–2.
As ***Micropanope distincta***—Menzies, 1948, p. 24.

Range: North Carolina; Florida Straits; Dry Tortugas; northwest Florida; Barbados.
Depth: 48 to 185 m (26 to 101 fm).
Habitat: sand and coral bottoms.
Remarks: Menzies (1948) transferred this species to *Micropanope* and he considered it to be close to *M. sculptipes* Stimpson, the type species of the genus. Cerame-Vivas and Gray (1966) extended the known range (listed as *Lophopanopeus*) to North Carolina.

Micropanope lobifrons A. Milne Edwards, 1880 (Crust. Rég. Mex., p. 327)

Rathbun, 1930, p. 429, pl. 178, figs. 4–6; Rathbun, 1933, p. 66.

Range: south Florida, in Gulf Stream; Dry Tortugas; off northwest Florida; off north coast of Cuba; Puerto Rico; Virgin Islands; Santa Cruz Island (Carib.); Grenada; Barbados; Colon, Panama.
Depth: 37 to 311 m (20 to 170 fm).
Habitat: sand, coral, rock, and broken shell substrates.
Remarks: Guinot (1968b) retained this species in *Micropanope* along with the type species, while revising the genus.

Micropanope nuttingi (Rathbun, 1898) (Bull. Lab. Nat. Hist. State Univ. Iowa 4: 271), novo comb. Rathbun, 1930 (Bull. U.S. Nat. Mus. 152: 450)

Rathbun, 1930, p. 450, text-fig. 74; Rathbun, 1933, p. 67, fig. 57; Williams, 1965, p. 194, figs. 177, 183J; Felder, 1973a, p. 66, pl. 9, fig. 22.

Range: North Carolina; east coast of Florida; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; Texas; north coast of Yucatan; north coast of Cuba; Jamaica; Puerto Rico; Virgin Islands; Old Providence Island (Carib.); Rio Grande do Norte, Brazil.
Depth: shore to 183 m (to 100 fm).
Habitat: rock, sand, coral, and broken-shell substrates; from boulder-covered beaches; from clumps of *Porites* and *Halimede*.
Remarks: Felder (1973a) notes that this species may be eventually placed in a different genus on the basis of differences in male first pleopods. Williams (1965) listed ovigerous females from Florida in July.

Micropanope pusilla A. Milne Edwards, 1880 (Crust. Rég. Mex., p. 327)

Rathbun, 1930, p. 431, pl. 179, figs. 7–8; Rathbun, 1933, p. 66.

Range: Dry Tortugas; northwest of Key West; west and northwest coasts of Florida; Alabama; north coast of Cuba; Jamaica; Puerto Rico; Virgin Islands.

Depth: 31 to 311 m (17 to 170 fm).

Habitat: sand, gravel, coral, and broken shell bottoms.

Remarks: Listed from Florida by Wass (1955), Abele (1970), and Menzel (1971). Rathbun (1930) reported ovigerous females from the Gulf of Mexico during February-March and June-July. Abele (1970) noted that this species does not fit any of the genera reviewed or erected by Guinot (1968a).

Micropanope sculptipes Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 140)

Rathbun, 1930, p. 428, pl. 178, figs. 1–3; Rathbun, 1933, p. 66; Williams, 1965, p. 193, fig. 175; Felder, 1973a, p. 66, pl. 9, fig. 15.

Range: North and South Carolina; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; Texas; St. Croix; Grenada; Barbados.

Depth: 9 to 311 m (5 to 170 fm).

Habitat: sand, gravel, coral, and broken shell bottoms.

Remarks: Listed from Florida by Wass (1955). Cerame-Vivas and Gray (1966) extended the known range of this crab to North Carolina.

Micropanope spinipes A. Milne Edwards, 1880 (Crust. Rég. Mex., p. 326)

Rathbun, 1930, p. 443, text-fig. 71, pl. 181, figs. 1–2; Pequegnat & Ray, 1974, p. 238, figs. 18–22.

Range: Bermuda; Bahamas; Florida Keys; West Flower Garden Bank, off Texas; Curaçao; Alagoas and off the Abrolhos Islands, Brazil.

Depth: low tide mark to 55 m (to 30 fm).

Habitat: sand and coral bottoms; off coral reefs; in sponges.

Micropanope truncatifrons Rathbun, 1898 (Bull. Lab. Nat. Hist. State Univ. Iowa 4: 274)

Rathbun, 1930, p. 433, text-fig. 68, pl. 178, figs. 7–8.

Range: off north coast of Cuba; off Caribbean coast of Yucatan.

Depth: 238 to 355 m (130 to 194 fm).

Habitat: coral sand bottoms.

Remarks: This species may be eventually transferred to the genus *Nanocassiope*. Guinot (1971, p. 1076) noted a resemblance between this species and *N. melanodactylus* (A. Milne Edwards), the type species of the genus recently erected by Guinot (1967a).

Micropanope urinator (A. Milne Edwards, 1881) (Crust. Rég. Mex., p. 289)

Rathbun, 1930, p. 451, pl. 182, figs. 3–4, pl. 183, figs. 1–3; Chace, 1940, p. 34; Williams, McCloskey & Gray, 1968, p. 51, fig. 7.

Range: off North Carolina; Florida Keys; north and south coasts of Cuba; St. Croix.

Depth: 146 to 457 m (80 to 250 fm).

Habitat: sand and coral bottoms.

Micropanope xanthiformis (A. Milne Edwards, 1880).

Transferred to a new genus, *Nanoplax*, by Guinot (1967a). See *Nanoplax xanthiformis*.

Nanoplax Guinot, 1967

Nanoplax xanthiformis (A. Milne Edwards, 1880) (Crust. Rég. Mex., p. 353)

As ***Micropanope xanthiformis***—Rathbun, 1930, p. 442, pl. 180, figs. 7–8; Rathbun, 1933, p. 67; Williams, 1965, p. 193, figs. 176, 183I.
As ***Nanoplax xanthiformis***—Guinot, 1967a, p. 362, fig. 16.

Range: North Carolina to off south Florida; Florida Keys and Dry Tortugas; northwest coast of Florida; north coast of Cuba; off Caribbean coast of Yucatan; Puerto Rico; Dominica; Barbados; Grenada; Curaçao; off Cape Frio, Brazil.

Depth: 9 to 333 m (5 to 182 fm).

Habitat: sand, broken shell, coral, and mud substrates.

Remarks: Guinot (1967a) discussed the affinities of this species and genus with certain genera of Goneplacidae. Listed from northwest Florida (as *Micropanope*) by Wass (1955) and Hulings (1961). Ovigerous females are known from Florida in June and August and from North Carolina in October (Williams, 1965).

Neopanope A. Milne Edwards, 1880

Neopanope packardii (Kingsley, 1879) (Proc. Boston Soc. Nat. Hist. 20: 152)

Rathbun, 1930, p. 380, text-fig. 59, pl. 168, figs. 5–6; Abele, 1972a, p. 269, figs. 1B, 3A.

Range: southeast and south Florida; Bahamas; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; Louisiana; north coast of Cuba.

Depth: low tide mark to 74 m (to 135 fm).

Habitat: sand, gravel, rock, and coral substrates; occasionally in mud; grass beds, algal beds, marshes; on *Styela*.

Remarks: A systematic review and morphological key for this genus was presented by Abele (1972a). Abele (1971) provided scanning electron micrographs of the gonopods of this crab and other *Neopanope*. Larval development was described by Costlow and Bookhout (1967); larvae of various *Neopanope* species were compared by McMahan (1967). Records of ovigerous crabs were listed by Rathbun (1930). Listed from Florida by Tabb and Manning (1961), Dragovich and Kelly (1964), Abele (1970), Rouse (1970), Menzel (1971), and Lyons *et al.* (1971), and from Louisiana by Hoese and Valentine (1972).

Neopanope texana (Stimpson, 1859) (Ann. Lyc. Nat. Hist. New York 7: 55)

As ***N. texana texana***—Rathbun, 1930, p. 367, text-fig. 57, pl. 168, figs. 1–2.
As ***N. texana***—Abele, 1972a, p. 266, figs. 1A, 2A, 2E, 3B, 3C; Felder, 1973a, p. 68, pl. 9, fig. 19; not Williams, 1965, p. 190 (= *N. sayi*).

Range: west coast of Florida (south as far as Charlotte County) to south Texas.

Depth: low tide mark to 51 m (to 28 fm).

Habitat: *Thalassia* grass flats; mud, sand, rock, and gravel substrates; among barnacles, clumps of ascidians.

Remarks: Abele (1972a) reviewed the status of the two related species, *N. texana* and *N. sayi*. The latter form is restricted in distribution to the east coast

of the United States, whereas *N. texana* occurs only along the Gulf coast. Reports of *N. texana* in southern Florida (Tabb and Manning, 1961) are attributed by Abele to *N. packardii*. Williams (1965) listed this species from North Carolina, but Abele (1972a) states that the figures are of *N. sayi*. Florida listings include Wass (1955), Dragovich and Kelly (1964), Abele (1970), Lyons *et al.* (1971), and Menzel (1971). Other listings (some as *N. texana sayi* (= *N. sayi*), but all are referred to *N. texana*) include the northwestern Gulf (Fotheringham and Brunenmeister, 1975) and Texas (Simmons, 1957; Parker, 1959; Hoese, 1960; Breuer, 1962; Hoese and Jones, 1963; Keith and Hulings, 1965; Leary, 1967). McMahan (1967) described larvae reared in the laboratory. Landers (1954) noted predation by this species on clams. Ryan (1956) gave accounts of life history for *N. sayi*, which should be very similar to that of *N. texana*.

Panopeus H. Milne Edwards, 1834

Panopeus americanus Saussure, 1857 Rev. Mag. Zool., ser. 2, vol. 9: 502)

Rathbun, 1930, p. 357, pl. 164, figs. 3–4, 6; Rathbun, 1933, p. 62.

Range: Bahamas; Florida Keys; west coast of Florida; north coast of Cuba; Jamaica; Dominican Republic; Puerto Rico; St. Thomas, Virgin Islands; Guadeloupe; Trinidad; Caribbean coast of Colombia; Rio Parahyba do Norte to Santa Catarina, Brazil.

Depth: intertidal to 22 m (to 12 fm).

Habitat: under stones, on mud flats; on mangroves; sand, shell, and mud bottoms; grass flats; under sponges and bryozoans.

Remarks: Listed from south Florida by Tabb and Manning (1961).

Panopeus bermudensis Benedict & Rathbun, 1891 (Proc. U.S. Nat. Mus. 14: 376)

Rathbun, 1930, p. 360, text-fig. 56, pl. 165; Rathbun, 1933, p. 62; Garth, 1961, p. 149; Felder, 1973a, p. 69, pl. 9, fig. 20.

Range: Bermuda; Bahamas; west coast of Florida; ?Texas; north coast of Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands; Trinidad; Old Providence Island (Carib.); Colombia to Santa Catarina, Brazil; in Pacific—from Magdalena Bay, Mexico to Peru.

Depth: low tide mark to 15 m (to 8 fm).

Habitat: oyster beds; rocky tide pools; under rocks, sponges, bryozoans, debris, and among fouling organisms; from bays and near-marine waters; on mangrove roots; from sand bottoms.

Remarks: Felder (1973a) listed this species from Texas on the basis of a tentative identification. Garth (1961) noted the variability of this species over its entire geographical range and pointed to the possibility of future segregation of this species into distinct Pacific and Atlantic forms.

Panopeus harttii Smith, 1869 (Proc. Boston Soc. Nat. Hist. 12: 280)

Rathbun, 1930, p. 355, pl. 164, figs. 1–2, 5; Rathbun, 1933, p. 62.

Range: Florida Keys and Dry Tortugas; Isla de Piños, Cuba (Carib.); Puerto

Rico; St. Thomas, Virgin Islands; Antigua; Barbados; Pernambuco to São Paulo, Brazil.

Depth: low tide mark and shallow waters.

Habitat: on rocks and coral reefs.

Remarks: Color and habitat in Brazil were described by Fausto Filho (1974).

Panopeus herbstii H. Milne Edwards, 1834 (Hist. Nat. Crust., vol. 1, p. 403)

Common Name: Common Mud Crab

Hay & Shore, 1918, p. 437, pl. 34, fig. 9; Rathbun, 1930, p. 335, text-figs. 52–53, pls. 156–157; Chace, 1940, p. 34; Ryan, 1956, p. 147, text-figs. 4B, 5B, 9A, pl. 1C; Edmondson, 1962, p. 277; Williams, 1965, p. 196, figs. 180, 183M; Chace & Hobbs, 1969, p. 154, figs. 46c, 47; Felder, 1973a, p. 69, pl. 9, fig. 21.

Range: Bermuda; Bahamas; Massachusetts to south Florida; Florida Keys and Dry Tortugas; west coast of Florida to Veracruz, Mexico; north and south coasts of Cuba; Jamaica; Haiti; Puerto Rico; Virgin Islands; Antigua to Barbados; Trinidad; Islas Los Roques; Netherlands Antilles; Belize; Caribbean coast of Panama to Venezuela; Rio Parahyba do Norte, Brazil to Uruguay; in Pacific—Hawaiian Islands.

Depth: intertidal to 22 m (12 fm).

Habitat: muddy bottoms of bays and estuaries; shell, rock, and stone bottoms; oyster beds; among mangroves and in banks of tidal streams; burrows in mud banks and under stones or shells; on coral and rock reefs; brackish tide pools; sandy beaches with rocks.

Remarks: Larval development has been described by Costlow and Bookhout (1961a) and Costlow, Bookhout and Monroe (1962). Sulkin (1973) reported on larval depth regulation and Sandifer (1973) gathered data on larval ecology in Chesapeake Bight. Schwartz and Cargo (1960) recorded this crab in Virginia and Maryland. Life history studies include those of Ryan (1956) in Chesapeake Bay and Warner (1969) in Jamaica. Rathbun (1930) listed three forms, in addition to the typical form, of this species and provided distribution records for each. Furtado-Ogawa (1972) noted individual variations and habitat differences for this species in Brazil. Williams (1965) provided a summary of the many studies on this crab. Relationships with oysters and role as a molluscan predator are included in reports by McDermott and Flower (1953), Ryan (1956), Menzel and Nichy (1958) and McDermott (1960). Perkins (1975) describes the fine structure of a haplosporid parasite of this crab and Humes (1941a) noted the presence of a parasitic barnacle. Forward (1977) studied shadow responses of the larvae. Physiological studies include reports on antennule chemosensitivity (Hazlett, 1971), coagulation (Morrison and Morrison, 1952), thoracic neurosection (Maynard, 1961a, 1961b; Maynard and Maynard, 1962), gill area (Gray, 1957), respiration in relation to habitat (Ayres, 1938; Teal, 1959), amino acid metabolism (Boone and Claybrook, 1977), and respiration and metabolism (Leffler, 1973). Regional lists include Florida (Wass, 1955; Dragovich and Kelly, 1964; Abele, 1970; Menzel, 1971; Subrahmanyam *et al.*, 1976), Mississippi (Richmond, 1968; Christmas and Langley, 1973), Louisiana (Behre, 1950; Hoese and Valentine, 1972), Texas (Leary, 1967), and the northwestern Gulf of Mexico (Fotheringham and Brunenmeister, 1975).

Panopeus occidentalis Saussure, 1857 (Rev. Mag. Zool., ser. 2, vol. 9: 502)

Rathbun, 1930, p. 348, text-fig. 55, pl. 161; Rathbun, 1933, p. 61; Williams, 1965, p. 198, figs. 181, 183N.

Range: Bermuda; Bahamas; North Carolina to southeast Florida; Florida Keys and Dry Tortugas; west coast of Florida; north coast of Cuba; Jamaica; Hispaniola; Puerto Rico; Virgin Islands; Guadeloupe; Old Providence Island (Carib.); Curaçao; Trinidad; Colon, Panama to Santa Catarina, Brazil.

Depth: intertidal to 18 m (to 10 fm).

Habitat: sand, shell, rock, and gravel bottoms; among ascidians, sponges, and seaweed; on mangrove roots; under rocks; on pilings and piers.

Remarks: Although both of the environmental forms listed by Rathbun (1930) were recorded from Louisiana by Behre (1950), Felder (1973a) doubts the validity of the Grand Isle records and believes that they may represent *P. herbstii*. Williams (1965) provided a good summary of data on this crab. Listed from Florida by Tabb and Manning (1961) and by Lyons *et al.* (1971). De Oliveira (1940) described specimens from Brazil and provided notes on life history; Furtado-Ogawa (1972) noted individual variations and habitat differences in Brazil.

Panopeus rugosus A. Milne Edwards, 1880 (Crust. Rég. Mex., p. 314)

Rathbun, 1930, p. 353, pls. 162–163.

Range: Florida Keys and Dry Tortugas; west and northwest coasts of Florida; north coast of Cuba; Haiti; Virgin Islands; Puerto Rico; Honduras to Nicaragua; Curaçao; Bahia to Santa Catarina, Brazil.

Depth: low tide mark to 51 m (to 28 fm).

Habitat: sand, shell, rock, and coral bottoms; coral reefs; on pilings.

Remarks: listed from northwest Florida by Wass (1955)

Panopeus turgidus Rathbun, 1930 (Bull. U.S. Nat. Mus. 152: 364)

Rathbun, 1930, p. 364, pl. 166; Felder, 1973a, p. 68, pl. 9, fig. 18.

Range: northwest coast of Florida to Texas.

Depth: near shore, shallow waters.

Habitat: bay and near-marine waters; found on or among rocks, shells, debris, and vegetation.

Remarks: Listed from northwest Florida by Wass (1955) and from Louisiana by Behre (1950). Abele (1970) collected a specimen from northwest Florida and Fenner Chace, Jr. of the USNM confirmed its identity by comparison with the type, suggesting it was similar to the genus *Eurypanopeus*. Abele (1970) listed it in his thesis as *Eurypanopeus turgidus* and this was repeated in the list by Menzel (1971). As indicated under this latter name, this present listing will continue to use *Panopeus turgidus* until a definitive study or revision is available.

Paractaea Guinot, 1969

Paractaea rufopunctata nodosa (Simpson, 1860) (Ann. Lyc. Nat. Hist. New York 7: 203)

As ***Actaea rufopunctata nodosa***—Rathbun, 1930, p. 257, pl. 105, figs. 1–2;

Rathbun, 1933, p. 56; Holthuis & Gottlieb, 1956, p. 287; Williams, McCloskey & Gray, 1968, p. 51.

As ***Paractaea rufopunctata*** forma *nodosa*—Guinot, 1969b, p. 252, fig. 25.

Range: North Carolina; Bahamas; east coast of Florida; Florida Keys and Dry Tortugas; north coast of Cuba; Jamaica; Haiti; Puerto Rico; Virgin Islands; Barbados; Curaçao; Cape Frio, Brazil; Ascension Island, South Atlantic.

Depth: 5 to 212 m (3 to 115 fm).

Habitat: coral, broken shell, stone, and sand bottoms; in sponges.

Remarks: This genus was erected by Guinot (1969b) for several species of *Actaea*. She compared the differences and similarities of this form and forma *africana* and other forms of the *rufopunctata* complex, deciding that further research was needed to clarify the systematic relationships of the genus.

Paraliomera Rathbun, 1930

Paraliomera dispar (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 140)

Rathbun, 1930, p. 244, text-fig. 38, pl. 101, figs. 4–5; Rathbun, 1933, p. 54.

Range: Bermuda; Florida Keys and Dry Tortugas; north coast of Cuba; Jamaica; Haiti; Puerto Rico; Antigua; Barbados; Curaçao; Caribbean coast of Colombia.

Depth: shallow water to 154 m (to 84 fm).

Habitat: sand, shell, grassy, and mud bottoms; coral reefs and rocky areas.

Paraliomera longimana (A. Milne Edwards, 1865) (Nouv. Arch. Mus. Hist. Nat., Paris 1: 221).

Rathbun, 1930, p. 243, pl. 101, figs. 1–3; Rathbun, 1933, p. 53, fig. 46.

Range: Florida Keys and Dry Tortugas; Veracruz, Mexico; Puerto Rico; Virgin Islands; Barbados; Curaçao.

Depth: shallow water to 154 m (84 fm).

Habitat: coral reefs and rocky and grassy substrates.

Phymodius A. Milne Edwards, 1863

Phymodius maculatus (Stimpson, 1860).

This species was transferred to *Etisus* by Guinot (1969b), thus leaving the genus *Phymodius* unrepresented in the Gulf of Mexico.

Pilumnoides H. Milne Edwards & Lucas, 1843

Pilumnoides nudifrons (Stimpson, 1871) (Bull. Mus. Comp. Zool. 2: 143)

Rathbun, 1930, p. 538, pl. 218, figs. 1–2.

Range: Florida Straits and Keys; Barbados.

Depth: 128 to 556 m (70 to 304 fm).

Habitat: sand and rock substrates.

Pilumnus Leach, 1815

Pilumnus caribaeus Desbonne & Schramm, 1867 (Crust. Guadeloupe, p. 32)

Rathbun, 1930, p. 491, pl. 200, figs. 3–4; Rathbun, 1933, p. 71.

Range: Bahamas; Florida Keys; north coast of Cuba; Jamaica; Puerto Rico; Vieques and Culebra; Virgin Islands; Guadeloupe; Curaçao; Bahia to São Paulo, Brazil.

Depth: low tide mark to 29 m (to 16 fm).

Habitat: mud, sand, shell, grassy, and coral bottoms.

Pilumnus dasypodus Kingsley, 1879 (Proc. Boston Soc. Nat. Hist, 20: 155)

Rathbun, 1930, p. 493, pl. 200, figs. 5–6; Rathbun, 1933, p. 72; Williams, 1965, p. 178, figs. 157C, 159; Felder, 1973a, p. 61, pl. 9, fig. 7.

Range: North and South Carolina; Florida Keys and Dry Tortugas; south to northwest Florida; Mississippi; Texas; north and south coasts of Cuba; Jamaica; Puerto Rico; Culebra; Virgin Islands; Martinique; Curaçao; Pernambuco to Santa Catarina, Brazil.

Depth: 1 to 29 m (0.5 to 16 fm).

Habitat: sand, shell, rocky, and coral bottoms; from mangrove roots; with fouling materials on pilings, buoys and jetties; off sponges.

Remarks: Sandifer (1974) studied larval development. Williams (1965) reviewed records of ovigerous females. Ecological notes were provided by Lunz (1937), Pearse (1934), and Pearse and Williams (1951). Listed from Florida (Wass, 1955; Abele, 1970; Menzel, 1971; Lyons *et al.*, 1971), Mississippi (Christmas and Langley, 1973) and from Texas (Leary, 1967).

Pilumnus diomedeae Rathbun, 1894 (Proc. U.S. Nat. Mus. 17: 85)

Rathbun, 1930, p. 501, pl. 202, figs. 2–3.

Range: north coast of Cuba; Caribbean coast of Yucatan.

Depth: 238 to 337 m (130 to 184 fm).

Habitat: coral and sand bottoms.

Pilumnus floridanus Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 141)

Rathbun, 1930, p. 507, pl. 205, figs. 3–4; Rathbun, 1933, p. 72; Williams, 1965, p. 179, figs. 157D, 160; Felder, 1973a, p. 61, pl. 9, fig. 8; Pequegnat & Ray, 1974, p. 238, figs. 23–24.

Range: North Carolina; Bahamas; Florida Keys and Dry Tortugas; west and northwest coasts of Florida; off Texas; north of Yucatan; Honduras; Jamaica; Puerto Rico; Culebra; Virgin Islands; Venezuela.

Depth: low tide mark to 146 m (to 80 fm).

Habitat: sand, shell, gravel, rock, and coral substrates; mud and grassy bottoms; inside sponges.

Remarks: Listed from the Gulf by Chace (1956) and from Florida by Wass (1955) and Lyons *et al.* (1971). Williams (1965) reported ovigerous females from Florida in March to August and from North Carolina in February. Pearse and Williams (1951) collected this crab from sponges in North Carolina waters.

Pilumnus gemmatus Stimpson, 1860 (Ann. Lyc. Nat. Hist. New York 7: 214)

Rathbun, 1930, p. 513, pl. 207, figs. 1–3; Rathbun, 1933, p. 72.

Range: Dry Tortugas; Culebra; Virgin Islands; Curaçao.

Depth: shore to 42 m (to 23 fm).

Habitat: shallow water lagoons; coral and rock bottoms; in corals; on seawoods.

Pilumnus holosericus Rathbun, 1898 (Bull. Lab. Nat. Hist. State Univ. Iowa 4: 268)

Rathbun, 1930, p. 519, text-fig. 81, pl. 207, figs. 8–9; Rathbun, 1933, p. 73, fig. 61.

Range: Bahamas; Dry Tortugas; Puerto Rico; Virgin Islands; Trinidad; Curaçao.

Depth: shallow water.

Habitat: near shore, under stones; coral reefs; rocky areas.

Pilumnus lacteus Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 142)

Hay & Shore, 1918, p. 440, pl. 35, fig. 3; Rathbun, 1930, p. 511, pl. 205, figs. 1–2; Williams, 1965, p. 180, figs. 157E, 161.

Range: North and South Carolina; Florida Keys and Dry Tortugas; west coast of Florida; north coast of Cuba.

Depth: low tide mark to 15 m (8 fm).

Habitat: sand, shell, rock, coral, and mud substrates; among sponges and seaweed; under stones; on buoys and pilings; in beds of *Thalassia*.

Remarks: Williams (1965) listed records of ovigerous females; Lunz (1937) provided notes on ecology of South Carolina populations. listed from Florida by Wass (1955), Tabb and Manning (1961) and Lyons *et al.* (1971). Rouse (1970) found this crab to be the most common pilumnid collected in Florida Bay.

Pilumnus longleyi Rathbun, 1930 (Bull. U.S. Nat. Mus. 152: 502)

Rathbun, 1930, p. 502, pl. 202, figs. 4–5.

Range: Bahamas; Florida Keys and Dry Tortugas.

Depth: shallow water.

Habitat: rocky and coral bottoms.

Remarks: Rathbun (1930) noted that this species is easily confused with *P. caribaeus* and *P. sayi*; she compared the three species morphologically and described the young of *P. longleyi*.

Pilumnus marshi Rathbun, 1901 (Bull. U.S. Fish. Comm. for 1900. vol. 20, pt. 2, p. 41)

Rathbun, 1930, p. 499, text-fig. 80; Rathbun, 1933, p. 72.

Range: Dry Tortugas; Virgin Islands.

Depth: shallow water to 37 m (to 20 fm).

Habitat: coral bottoms.

Pilumnus pannosus Rathbun, 1896 (Proc. U.S. Nat. Mus. 19: 142)

Rathbun, 1930, p. 514, pl. 207, figs. 4–5; Rathbun, 1933, p. 72; Williams, 1965, p. 181, figs. 157F, 162; Felder, 1973a, p. 64, pl. 9, fig. 12.

Range: North Carolina; Bahamas; southeast Florida; Florida Keys; west and northwest coasts of Florida; Texas; Puerto Rico; Jamaica; Virgin Islands.

Depth: 1 to 16 m (to 9 fm).

Habitat: sand, shell, rock, and coral substrates; on jetties and reefs with fouling material; with sponges and corals.

Remarks: Williams (1965) listed records of ovigerous females. Listed from Florida by Wass (1955) and from Texas by Leary (1967). Pearse and Williams (1951) collected this crab from submerged reefs off North Carolina.

Pilumnus sayi Rathbun, 1897 (Ann. Inst. Jamaica 1: 15)

Common Name: Hairy Crab

Hay & Shore, 1918, p. 440, pl. 35, fig. 4; Rathbun, 1930, p. 484, pl. 200, figs. 1–2, pl. 201, figs. 4–7; Rathbun, 1933, p. 71; Williams, 1965, p. 177, figs. 157A–B, 158; Felder, 1973a, p. 61, pl. 9, fig. 6.

Range: North Carolina to Georgia; Bahamas; east coast of Florida; Dry Tortugas; west and northwest coasts of Florida; Louisiana and Texas; Jamaica; Puerto Rico; Guadeloupe; Curaçao.

Depth: low tide mark to 90 m (to 49 fm).

Habitat: sand, shell, rock, coral, and gravel bottoms; on offshore reefs; among fouling material on jetties, pilings, and buoys.

Remarks: Listed from Florida by Wass (1955), Dragovich and Kelly (1964), Abele (1970), Menzel (1971) and Lyons *et al.* (1971), the latter group remarking on the considerable variation in morphology of this species. Lunz (1939) reported collecting *P. marshi* off a shoal in North Carolina, but Williams (1965) believed this to be an aberrant *P. sayi*. Pearse (1934) reported this crab from inside a sponge. Collected by Chace (1956) in the northeastern Gulf. Chamberlain (1961) studied the physiological ecology of larval and megalops stages.

Pilumnus spinosissimus Rathbun, 1898 (Bull. Lab. Nat. Hist. State Univ. Iowa 4: 265)

Rathbun, 1930, p. 494, text-fig. 79, pl. 200, figs. 7–8.

Range: Florida Keys and Dry Tortugas.

Depth: 5 to 11 m (3 to 6 fm).

Habitat: from rocks, shell, and coral substrates.

Platyactaea Guinot, 1967

Platyactaea setigera (H. Milne Edwards, 1834) (Hist. Nat. Crust., vol. 1, p. 390)

As ***Actaea setigera***—Rathbun, 1930, p. 251, pl. 103; Rathbun, 1933, p. 55.
As ***Platyactaea setigera***—Guinot, 1967b, p. 561, fig. 36.

Range: Bermuda; Bahamas; Florida Keys and Dry Tortugas; north coast of Cuba; Jamaica; Puerto Rico; Virgin Islands; Antigua; Barbados; Trinidad; Curaçao; Caribbean coast of Colombia.

Depth: intertidal and shallow water.

Habitat: coral reefs; among and under rocks.

Remarks: Guinot (1967b) placed this species in a new genus and discussed the systematic affinities of related species.

Platypodia Bell, 1835

Platypodia spectabilis (Herbst, 1794).

This species was transferred to a new genus, *Platypodiella*, by Guinot (1967b). leaving this genus without a representative in the Gulf of Mexico.

Platypodiella Guinot, 1967

Platypodiella spectabilis (Herbst, 1794) (Natur. Krabben u. Krebse, vol. 2, p. 153)

> As ***Platypodia spectabilis***—Rathbun, 1930, p. 247, text-fig. 39, pl. 102, fig. 4; Rathbun, 1933, p. 54, fig. 47.
> As ***Platypodiella spectabilis***—Guinot, 1967b, p. 562; Felder, 1973a, p. 65, pl. 9, fig. 10.

Range: Bermuda; Bahamas; Florida Keys; Texas; Veracruz, Mexico, Jamaica; Puerto Rico; Virgin Islands; Guadeloupe; Martinique; Barbados; Curaçao; Fernando de Noronha, Brazil.

Depth: 4 to 13 m (2 to 7.5 fm).

Habitat: coral reefs; under stones.

Remarks: This species is illustrated by Forest & Guinot (1966, fig. 7). Listed from Brazil and described by Fausto Filho (1974). Guinot (1967b) transferred this species from *Platypodia* to the newly-erected genus.

Pseudomedaeus Guinot, 1967

Pseudomedaeus agassizii (A. Milne Edwards, 1880) (Crust. Rég. Mex., p. 270)

> As ***Leptodius agassizii***—Hay & Shore, 1918, p. 441, pl. 34, fig. 6; Rathbun, 1930, p. 307, pl. 141, figs. 4–5; Williams, 1965, p. 192, figs. 174, 183H.
> As ***Pseudomedaeus agassizii***—Guinot, 1968a, p. 726, fig. 25; Felder, 1973a, p. 67, pl. 9, fig. 11.

Range: North Carolina; Florida Straits and Keys; Dry Tortugas; west and northwest coasts of Florida; Louisiana and Texas; Virgin Islands.

Depth: 7 to 82 m (4 to 45 fm).

Habitat: sand, shell, rock, and coral bottoms; from sponges.

Remarks: Costlow and Bookhout (1968a) described larval development. Williams (1965) noted morphological variability over the range of this species and reported ovigerous females from April to November. Listed from Florida by Wass (1955) and Abele (1970). Abele (1970) commented on variation in anterolateral teeth and tuberculation of the chelae.

Rhithropanopeus Rathbun, 1898

Rhithropanopeus harrisii (Gould, 1841) (Rept. Invert. Massachusetts, p. 326)

> Hay & Shore, 1918, p. 441, pl. 35, fig. 5; Rathbun, 1930, p. 456, text-fig. 75, pl. 183, figs. 7–8; Williams, 1965, p. 187, figs. 169, 183C; Christiansen, 1969, p. 81, fig. 33, map 27; Felder, 1973a, p. 67, pl. 9, fig. 14.

Range: New Brunswick to south Florida; west and northwest coasts of Florida;

Mississippi to Veracruz, Mexico; introduced to west coast of United States and to various parts of Europe in recent times.

Depth: intertidal to 37 m (to 20 fm), most common to 9 m (5 fm).

Habitat: freshwater and estuarine areas; upper bays with salinities usually less than 20 ppt; on oyster reefs; on living and dead vegetation; under rocks and in old cans and other debris.

Remarks: Ryan (1956) provided an account of the life history of this crab, based on studies in Chesapeake Bay. Williams (1965) reviewed much of the pertinent literature on this species. Studies of larval forms include those of Connolly (1925), Hood (1962), Chamberlain (1962), Costlow (1966), Costlow, Bookhout and Monroe (1966), Bookhout *et al* (1972), Ott and Forward (1976), and Sandifer (1973).

The European populations were considered a separate subspecies, *R. h. tridentatus* Maitland, by Buitendijk and Holthuis (1949), but this was questioned by Wolff (1954). Christiansen (1969) reviewed the distributional data for this species in Europe and treated the different populations as conspecific, with no distinct subspecies recognized. Reports of this crab on the U.S. Pacific coast include Jones (1940), Felice (1958), and Ricketts and Calvin (1968). Regional lists include Florida (Wass, 1955; Tabb and Manning, 1961; Abele, 1970; Menzel, 1971), Mississippi (Christmas and Langley, 1973), Louisiana (Behre, 1950), Texas (Hedgpeth, 1953; Leary, 1967), and the northwestern Gulf (Fotheringham and Brunenmeister, 1975).

Physiological studies include data on osmoregulation (Jones, 1941; Verway, 1957; Kalber and Costlow, 1966; R. I. Smith, 1967), effects of pesticides on larval development (Bookhout and Costlow, 1976), metabolism and larval development (Rosenberg and Costlow, 1976), effects of juvenile hormone on larvae (Christiansen, Costlow and Monroe, 1977a, b), sterol synthesis in larvae (Whitney, 1969), androgen glands (Payen, Costlow and Charniaux-Cotton, 1971), and eyestalk hormones (Skorkowski, 1972).

Tetraxanthus Rathbun, 1898

Tetraxanthus bidentatus (A. Milne Edwards, 1880) (Crust. Rég. Mex., p. 353)

As ***T. rugosus*** Rathbun—Rathbun, 1930, p. 459, pl. 185.
As ***T. bidentatus***—Chace, 1939, p. 52; Chace, 1940, p. 36.

Range: Florida Keys; north and south coasts of Cuba; Grenada.

Depth: 168 to 293 m (92 to 160 fm).

Habitat: sand and coral bottoms.

Remarks: The species described and illustrated by Rathbun (1930) as *T. bidentatus* was actually a new species, which Chace (1939) named *T. rathbunae* (= *T. rathbuni*). The species Rathbun (1930) listed as *T. rugosus* n. sp. is *T. bidentatus*.

Tetraxanthus rathbunae Chace, 1939 (Mem. Soc. Cubana Hist. Nat. 13: 52)

As ***T. bidentatus*** (A. Milne Edwards)—Rathbun, 1930, p. 458, pl. 184.
As ***T. rathbunae***—Chace, 1939, p. 52; Chace, 1940, p. 37.
As ***T. rathbuni***—Pequenat, 1970, p. 195.

Range: North Carolina; southeast Florida; Florida Keys; west coast of Florida; north and south coasts of Cuba; off Mississippi; Campeche, off Yucatan; off Grenda; off Cape Frio, Brazil.

Depth: 108 to 476 m (59 to 260 fm).

Habitat: mud, coral, shell, sand, and rock bottoms.

Remarks: This is the species described by Rathbun (1930) as *T. bidentatus* (A. Milne Edwards), but it is not *Xanthodes bidentatus* A. Milne Edwards, the original designation of the species *Tetraxanthus bidentatus*. Chace (1956, p. 19) listed this species from the Gulf of Mexico.

Tetraxanthus rugosus Rathbun, 1930.

This is a junior synonym of *Xanthodes bidentatus* (= *Tetraxanthus bidentatus*), therefore Chace (1939, p. 52) substituted *T. rathbunae* for Rathbun's *T. bidentatus* and *T. rugosus* is synonymized with *T. bidentatus* (A. Milne Edwards).

Xantho Leach, 1814

Xantho denticulata White, 1847 (List Crustacea British Mus., p. 17)

> As ***Xanthodius denticulatus***—Rathbun, 1930, p. 314, pl. 314, pl. 145, fig. 1, pl. 146.
> As ***Xantho denticutata***—Monod, 1956, p. 280, figs. 335–339; Forest & Guinot, 1961, p. 60, fig. 51.

Range: Bermuda; Bahamas; Florida Keys and Dry Tortugas; northwest Florida; Jamaica; Puerto Rico; Virgin Islands; Antigua; Barbados; Colon, Panama; Curaçao; Trinidad; Pernambuco to Abrolhos Islands, Brazil, Gulf of Guinea, west coast of Africa.

Depth: near shore to 12 m (to 7 fm).

Habitat: tide pools; coral reefs; under rocks.

Remarks: Guinot (1968a, p. 711) commented on the relationships between species of this genus and other related genera, but she did not discuss *X. denticulata*, other than to raise the question of differences between specimens from west Africa and South America. Monod (1956) compared this crab with species of other genera, especially *Cycloxanthops*. Listed from northwest Florida by Abele (1970).

Xanthodius Stimpson, 1859

Xanthodius denticulatus (White, 1847).

Monod (1956) listed synonymies. This species was transferred to the genus *Xanthodius* by Rathbun (1930, p. 314); other authors have continued to treat it as a species of *Xantho*. Not *Xantho denticulata* Stimpson, 1860, a west coast species (= *Xanthodius stimpsoni* (A. Milne Edwards, 1879) proposed by Rathbun, 1930).

Family GERYONIDAE Colosi, 1924

> (The systematic status of this family and of the Goneplacidae is still subject to revision by Guinot and others. Balss (1957) placed this genus

between the Xanthidae and Carcinoplacinae as a link to the Goneplacidae. Bouvier (1940) included *Geryon* in the Xanthidae, but Rathbun (1937), Sakai (1939) and Barnard (1950) treated it as a genus of the Goneplacidae. In the present list, only the type genus, *Geryon*, is listed in the family; *Bathyplax* is retained in the Goneplacidae until further studies are available (refer to Guinot, 1969a, 1971).)

Geryon Krøyer, 1837

Geryon quinquedens Smith, 1879 (Trans. Connecticut Acad. Arts Sci. 5: 35)

Common Name: Deep Sea Red Crab

Rathbun, 1937, p. 271, not pls. 85–86; Chace, 1940, p. 38; Pequegnat, 1970, p. 189, fig. 6–7; Wigley, Theroux & Murray, 1975, p. 1.

Range: Nova Scotia to South Carolina; east coast of Florida; Florida Straits; off Key West; Dry Tortugas; off Alabama and Texas; off northeast Mexico; north coast of Cuba; off Cape Frio, Brazil.

Depth: 40 to 2153 m (22 to 1178 fm), most common at 320 to 914 m (175 to 500 fm).

Habitat: primarily on mud and ooze substrates, occasionally on sand or shell-mud bottoms.

Remarks: Chace (1940) compared this species with *G. affinis*, which is very similar in appearance. Plates 85 and 86 in Rathbun (1937) are of *G. affinis*. This latter species has also been caught off the coast of Florida, but it is more common in southern areas of the Atlantic and in the Indian Ocean. Le Loeuff *et al.* (1974) recently reported *G. quinquedens* from the Ivory Coast of Africa. When alive, there are color differences between these two species (Schroeder, 1959). Leone (1951) used serological techniques to investigate the taxonomic status of this crab. Musick and McEachran (1972) reported it from depths of 168 m in Chesapeake Bight. Accounts of the red crab fishery include those of Schroeder (1959), McRae (1961), Meade and Gray (1973), Holmsen and McAllister (1974), Ganz and Herrmann (1975), and Wigley, Theroux and Murray (1975). The latter study contains details of substrate and temperature data, a review of the life history of this crab, and *in situ* bottom photographs of the animal. Gray (1969) also provided an account of the biology of this species. Haefner and Musick (1974) reported its occurrence in Norfolk Canyon. Pequegnat (1970) indicated a center of depth range at about 914 m (500 fm) within the Gulf of Mexico, but all of the crabs taken by the R/V *Alaminos* at depths greater than 1170 m (640 fm) were juveniles. Haefner (1977) investigated reproduction in females.

Family GONEPLACIDAE Macleay, 1838 (sensu Balss, 1957)

(Guinot (1969a) has proposed several revisions in the systematic relationships of this family, most of them based on presumed affinities with genera of the Xanthidae, from which the Goneplacidae may have been derived. In the present list, the Gulf genera are listed alphabetically, as

they were for the Xanthidae, without regard to subfamily alignment. The genus *Geryon* is treated under a separate family, Geryonidae.)

Bathyplax A. Milne Edwards, 1880

Bathyplax typhla A. Milne Edwards, 1880 (Bull. Mus. Comp. Zool. 8: 16)

Rathbun, 1918, p. 19, text-fig. 4, pl. 2; Rathbun, 1933, p. 77, fig. 67; Chace, 1940, p. 43; Williams, McCloskey & Gray, 1968, p. 52, fig. 8; Pequegnat, 1970, p. 192, figs. 6–9, 6–10.

Range: off North Carolina; west coast of Florida; Mississippi; Texas and Mexico; west coast of Cuba; St. Croix; St. Lucia; off Recife, Brazil.

Depth: 402 to 878 m (220 to 480 fm); at 1106 m (605 fm) off Cuba. Pequegnat (1970) determined the highest densities of crabs at 512 m (280 fm) in the Gulf of Mexico.

Habitat: mainly from muddy substrates; also from coral bottoms. Pequegnat (1970) reported that blackened specimens were commonly collected, apparently due to contact with natural oil seepage.

Remarks: Recorded from the Gulf of Chace (1956). Pequegnat (1970) considers this crab to be the most common deep-water species in the Gulf of Mexico; ovigerous females were collected in August, November, and December. Guinot (1971) listed this species under the Xanthidae and under the Goneplacidae because of the uncertainty of its systematic affinities.

Chacellus Guinot, 1969

Chacellus filiformis Guinot, 1969 (Bull. Mus. Nation. Hist. Nat. 41: 722)

Guinot, 1969, p. 722, figs. 135–136, pl. V, fig. 4.

Range: between Bahamas and east coast of Florida; off northwest Florida.

Depth: 183 to 223 m (100 to 122 fm).

Chasmocarcinus Rathbun, 1898

Chasmocarcinus cylindricus Rathbun, 1901 (Bull. U.S. Fish. Comm. for 1900, vol. 2: 10)

Rathbun, 1918, p. 59, text-figs. 28–29; Rathbun, 1933, p. 80, fig. 73; Chace, 1940, p. 49; Pequegnat, 1970, p. 195.

Range: Mississippi; off Louisiana; Campeche, off Yucatan; north and south coasts of Cuba; Jamaica; Puerto Rico.

Depth: 13 to 1906 m (7 to 1075 fm).

Habitat: mud bottoms; sand, rock, and coral substrates.

Chasmocarcinus mississippiensis Rathbun, 1931 (Proc. Biol. Soc. Washington 44: 71)

Rathbun, 1931b, p. 71; Felder, 1973a, p. 70, pl. 10, fig. 2.

Range: off coasts of Mississippi, Louisiana, and Texas.

Depth: 4 to 91 m (2 to 50 fm).

Habitat: sand and mud bottoms.

Remarks: Dawson (1966) reported this species from off Grand Isle, Louisiana; Franks *et al.* (1972) obtained a single specimen from off Mississippi at 50 fm. Felder (1973a) reported specimens from Padre Island, Texas.

Chasmocarcinus obliquus Rathbun, 1898 (Bull. Lab. Nat. Hist. State Univ. Iowa 4: 286)

Rathbun, 1918, p. 58, text-fig. 27, pl. 14, figs. 1–2; Chace, 1940, p. 48.

Range: southeast of Bahamas; north and south coasts of Cuba.
Depth: 177 to 503 m (97 to 275 fm).
Habitat: mud and ooze substrates.

Eucratopsis Smith, 1869

Eucratopsis crassimanus (Dana, 1852) (Proc. Acad. Nat. Sci. Philadelphia, for 1851, vol. 5: 248)

Rathbun, 1918, p. 52, text-fig. 22, pl. 12, fig. 3, pl. 159, figs. 1–2; Guinot, 1969a, p. 258, figs. 6, 10, 25.

Range: Florida Keys; south and west coasts of Florida; Yucatan; Jamaica; Bahia to Rio de Janeiro, Brazil.
Depth: shallow water to 14 m (to 7.5 fm).
Habitat: sand, coral, and broken shell substrates.
Remarks: Tabb and Manning (1961) collected ovigerous females in October from Oyster Bay in south Florida.

Euphrosynoplax Guinot, 1969

Euphrosynoplax clausa Guinot, 1969 (Bull. Mus. Nation. Hist. Nat. 41: 720)

Guinot, 1969a, p. 720, figs. 127, 139, pl. IV, fig. 3; Pequegnat, 1970, p. 194.

Range: Dry Tortugas; off Alabama and Mississippi; Campeche, Yucatan.
Depth: 91 to 210 m (50 to 115 fm).

Euryplax Stimpson, 1859

Euryplax nitida Stimpson, 1859 (Ann. Lyc. Nat. Hist. New York 7: 60)

Rathbun, 1918, p. 34, pl. 7; Rathbun, 1933, p. 78, fig. 69; Williams, 1965, p. 202, fig. 185; Guinot, 1969a, p. 512, figs. 39, 41, 47, 56–57, pl. II, fig. 1; Felder, 1973a, p. 70, pl. 10, fig. 1.

Range: off North Carolina; Bermuda; Florida Keys; south and west coasts of Florida to Texas; Puerto Rico; St. Thomas, Virgin Islands.
Depth: shallow water to 90 m (to 49 fm).
Habitat: sand, shell, rock, and coral substrates; sandy grass flats.
Remarks: Menzel (1971) listed this crab as rare at Apalachee Bay and Abele (1970) collected only a single specimen in his study of the northeastern nearshore Gulf. Range reports for the western Gulf of Mexico are scant and questionable. Rathbun (1918) listed one specimen from New Orleans and Williams (1965) indicated a range extending to Texas. Felder (1973a) cites these reports but adds no new records.

Frevillea A. Milne Edwards, 1880

Frevillea barbata A. Milne Edwards, 1880 (Bull. Mus. Comp. Zool. 8: 15)

As ***Goneplax barbata***—Rathbun, 1918, p. 26, pl. 4, figs. 1, 3, pl. 5.
As ***Frevillea barbata***—Guinot, 1969a, p. 513, pl. II, fig. 2.

Range: west coast of Florida; Yucatan (Gulf); north coast of Cuba; off Grenada.

Depth: 55 to 168 m (30 to 92 fm).

Habitat: sand, broken coral bottoms.

Frevillea hirsuta (Borradaile, 1916) (Brit. Antarctic Exped., 1910, Zool., vol. 3, no. 2, p. 99)

As ***Goneplax hirsuta***—Rathbun, 1918, p. 28, text-fig. 7; Williams, 1965, p. 201, fig. 184.
As ***Frevillea hirsuta***—Guinot, 1969a, p. 513, text-figs. 33, 40, 58–59, pl. II. fig. 3.

Range: off North Carolina; off west and northwest Florida and Alabama; north of Yucatan; off Rio de Janeiro, Brazil.

Depth: 73 to 146 m (40 to 80 fm).

Remarks: Collected by the R/V *Oregon* from the Gulf of Mexico (Chace, 1956).

Frevillea tridentata A. Milne Edwards, 1880.

Transferred to the genus *Trapezioplax* by Guinot (1969a). *Trapezioplax tridentata.*

Glyptoplax Smith, 1870

Glyptoplax smithii A. Milne Edwards, 1880 (Crust. Rég. Mex., p. 336)

Rathbun, 1918, p. 51, pl. 13, figs. 3–4; pl. 158, figs. 7–10; Milne Edwards & Bouvier, 1923, p. 328, pl. 5, fig. 5; Williams, McCloskey & Gray, 1968, p. 55, fig. 11; Guinot, 1969a, p. 259.

Range: Bermuda; off North Carolina; west coast of Florida; Cape Catoche, Yucatan (Gulf coast).

Depth: 24 to 55 m (13 to 30 fm).

Habitat: sand, coral, gravel and rock bottoms.

Remarks: Guinot (1969a) believed that this species should be excluded from the genus, based on differences from the type species, *G. pugnax*, a Pacific form from Central America.

Goneplax Leach, 1814

(All three of the recognized Gulf species of this genus have been transferred to other genera by Guinot (1969a). *Goneplax barbata* and *G. hirsuta* are referred to *Frevillea* and *G. tridentata* is referred to *Trapezioplax*.)

Neopilumnoplax Serene, 1969

Neopilumnoplax americana (Rathbun, 1898) (Bull. Lab. Nat. Hist. State Univ. Iowa 4: 283)

As ***Pilumnoplax americana***—Rathbun, 1918, p. 21, text-figs. 5–6; Williams,

McCloskey & Gray, 1968, p. 52, fig. 9.

As ***Neopilumnoplax americana***—Guinot, 1969a, p. 689, figs. 83–84.

Range: off North Carolina and Georgia; Florida Keys and Straits; north coast of Cuba; Guadeloupe; Espirito Santo, Brazil; Arabian Sea.

Depth: 128 to 805 m (70 to 440 fm).

Habitat: sand, shell, coral, and rocky substrates.

Remarks: Chace (1940) recovered this crab from the stomach of a smooth dogfish (*Mustelus canis*) from off Havana, Cuba. Listed from Brazil by Rodrigues da Costa (1968a) and Coelho and Ramos (1972).

Panoplax Stimpson, 1871

Panoplax depressa Stimpson, 1871 (Bull. Mus. Comp. Zool. 2: 151)

Rathbun, 1918, p. 47, text-fig. 21, pl. 12, figs. 1–2; Rathbun, 1933, p. 80, fig. 72; Guinot, 1969a, p. 264, figs. 3, 12, 28, ? 29; Bright & Pequegnat, 1974, p. 33.

Range: Dry Tortugas; west coast of Florida; West Flower Garden Bank, off Texas; north coast of Cuba; north coast of Yucatan; Puerto Rico.

Depth: shallow water to 101 m (to 55 fm).

Habitat: sand, coral, and broken shell bottoms.

Remarks: Listed by Chace (1956) from off the west coast of Florida and by Bright and Pequegnat (1974) from silty-sand bottoms at West Flower Garden coral reef, at 330 foot depth.

Pilumnoplax Stimpson, 1858

Pilumnoplax americana Rathbun, 1898.

Transferred to the genus *Neopilumnoplax* by Guinot (1969a). See *Neopilumnoplax americana.*

Pilumnoplax elata (A. Milne Edwards, 1880) (Bull. Mus. Comp. Zool. 8: 18)

As ***Eucratoplax elata***—A. Milne Edwards, 1880, p. 18 (original type description, female holotype in Paris Museum, type locality is West Florida, 13 fms.). Not Rathbun, 1898, p. 281.

As ***Pilumnoplax elata***—Guinot, 1969a, p. 688. Not Rathbun, 1918, p. 23.

Range: West Florida, type locality.

Depth: 24 m (13 fm).

Remarks: Only the original description of A. Milne Edwards (1880) is valid for this species. All of the other material described by Rathbun (1918, p. 23) has been referred by Guinot (1969a, p. 688, 716–717) to other genra. The male specimen description of Rathbun (1918, p. 23) was referred to *Robertsella mystica* (Guinot, 1969a, p. 716) and the females and juveniles were referred to *Thalassoplax angusta* (Guinot, 1969a, p. 717). This leaves the original type specimen to represent this poorly known species in the Gulf of Mexico.

Pilumnoplax nitida Chace, 1940 (Torreia 3: 44)

Chace, 1940, p. 44, figs. 17–18; Guinot, 1969a, p. 689.

Range: north coast of Cuba.

Depth: 348 to 476 m (190 to 260 fm).

Remarks: Guinot (1969a) retained this species in the genus, but she commented on the obscurity of its relationships.

Prionoplax H. Milne Edwards, 1852

Prionoplax atlantica Kendall, 1891.

Referred to *Frevillea tridentata* by Guinot (1969a), who later decided that *F. tridentata* was different enough from other *Frevillea* to establish a new genus, *Trapezioplax*, for this species. See *Trapezioplax tridentata.*

Robertsella Guinot, 1969

Robertsella mystica Guinot, 1969 (Bull. Mus. Nation. Hist. Nat. 41: 716)

As ***Pilumnoplax elata*** in Rathbun (not A. Milne Edwards)—Rathbun, 1918, p. 23 (part, male description only), pl. 3 (part, male only).
As ***Robertsella mystica***—Guinot, 1969a, p. 716, figs. 132–133, pl. V, fig. 4.

Range: off southeast coast of Florida, Florida Straits.
Depth: 353 m (193 fm).
Habitat: sand bottom.
Remarks: Although this species has not been recorded from the Gulf of Mexico, it is included here because of the confusing nomenclatural history of *Pilumnoplax elata.* At present, this new species and genus includes only the mature male specimen described by Rathbun (1918, p. 23 and part of pl. 3).

Speocarcinus Stimpson, 1859

Speocarcinus carolinensis Stimpson, 1859.

This species was reported from the Gulf of Mexico, prior to revision by Guinot (1969a, p. 710), who referred the Gulf specimens to *S. lobatus*. The Carolinean specimens described in Williams (1965) are *S. carolinensis.*

Speocarcinus lobatus Guinot, 1969 (Bull. Mus. Nation, Hist. Nat. 41: 710)

As ***S. carolinensis***—Rathbun, 1918, p. 39 (part, specimen from Dry Tortugas only).
As ***S. lobatus***—Guinot, 1969a, p. 710, text-figs. 124–125, pl. IV, fig. 2; Felder 1973a, p. 70, pl. 10, fig. 3.

Range: Dry Tortugas; off Louisiana and Texas.
Depth: shallow water to 37 m (to 20 fm).
Habitat: probably inhabits burrows of polychaetes and crustaceans as does *S. carolinensis*.
Remarks: Dawson (1966) reported *S. carolinensis* from off Grand Isle, Louisiana and Felder (1973a) reported that specimens taken from that same area at later dates were *S. lobatus*.

Tetraplax Rathbun, 1901

Tetraplax quadridentata (Rathbun, 1898) ((Bull. Lab. Nat. Hist. State Univ. Iowa 4: 287)

Rathbun, 1918, p. 32, text-figs. 9–10, pl. 6, figs. 3–4; Rathbun, 1933, p. 78, fig. 68; Guinot, 1969a, p. 256, figs. 1, 14, 26.

Range: north coast of Cuba; Puerto Rico, Curaçao.
Depth: 8 to 22 m (4.5 to 12 fm).
Habitat: mud bottoms.

Thalassoplax Guinot, 1969

Thalassoplax angusta Guinot, 1969 (Bull. Mus. Nation. Hist. Nat. 41: 717)

As ***Pilumnoplax elata*** in Rathbun (not A. Milne Edwards)—Rathbun, 1918, p. 23 (part, female and juveniles, includes female on pl. 3).
As ***Thalassoplax angusta***—Guinot, 1969a, p. 717, figs. 131–132, pl. IV, fig. 2; Pequegnat, 1970, p. 192.

Range: east coast of Florida; off northwest Florida, Alabama and Mississippi; off east coast of Mexico; off Campeche, Yucatan.
Depth: 183 to 752 m (100 to 411 fm).
Habitat: mud, sand, broken shell bottoms.

Remarks: Pequegnat (1970) added several new records for the Gulf of Mexico and also commented on differences in morphological descriptions between the *Alaminos* specimens and that provided by Guinot (1969a, p. 717). The legends on Guinot's plates were transposed; the correct citations appear above and in Pequegnat (1970, p. 192). As previously discussed for *Robertsella mystica*, Rathbun's (1918, p. 23) description of *Pilumnoplax elata* does not conform to the type description of this species provided by A. Milne Edwards; thus all of the material included in Rathbun was transferred to new species and genera by Guinot (1969). *Thalassoplax angusta* includes the females and juveniles described by Rathbun, but not the mature male nor the original female holotype of *P. elata*.

Trapezioplax Guinot, 1969

Trapezioplax tridentata (A. Milne Edwards, 1880) (Bul. Mus. Comp. Zool. 8: 16)

As ***Goneplax tridentata***—Rathbun, 1918, p. 29.
As ***Prionoplax atlantica***—Rathbun, 1918, p. 30, text-fig. 8, pl. 6, figs. 1–2.
As ***Trapezioplax tridentata***—Guinot, 1969a, p. 713, figs. 128–129, 142.

Range: Florida Keys and Dry Tortugas; west coast of Florida; Barbados.
Depth: 13 to 42 m (7 to 23 fm).
Habitat: sand, coral, shell, and mud bottoms.

Remarks: Guinot (1969a) established this new genus based on a separation of *Frevillea tridentata* from the other species of *Frevillea*. *Trapezioplax tridentata* includes the original type, *Goneplax tridentata*, and *Prionoplax atlantica*, listed as separate species by Rathbun (1918).

Family PALICIDAE Bouvier, 1898 (= CYMOPOLIDAE Faxon, 1895)

Palicus Philippi, 1838

Palicus affinis A. Milne Edwards & Bouvier, 1899 (Bull. Mus. Hist. Nat. Paris 5: 122)

As ***Cymopolia affinis***—Rathbun, 1918, p. 196, text-fig. 121, pl. 46, pl. 47, fig. 3; Rathbun, 1933, p. 85.

Range: southeast and west coasts of Florida; Dry Tortugas; Virgin Islands; Barbados; Guianas to Espirito Santo, Brazil.

Depth: 33 to 214 m (18 to 117 fm).

Habitat: sand, shell, and coral substrates.

Remarks: Listed from Brazil by Rodrigues da Costa (1968a), Coelho (1971c), and Coelho and Ramos (1972).

Palicus alternatus Rathbun, 1897 (Proc. Biol. Soc. Washington 11: 95)

As ***Cymopolia alternata***—Rathbun, 1918, p. 188, text-fig. 117, pls. 42–43.
As ***Palicus alternatus***—Williams, 1965, p. 215, fig. 200.

Range: North Carolina; Florida Keys; west and northwest coasts of Florida.

Depth: 7 to 110 m (4 to 60 fm).

Habitat: sand, gravel, broken shell, coral, and sand-mud bottoms.

Remarks: Ovigerous females are known from Florida during January to August and from North Carolina in October (Williams, 1965).

Palicus cursor (A. Milne Edwards, 1880) (Bull. Mus. Comp. Zool. 8: 29)

As ***Cymopolia cursor***—Rathbun, 1918, p. 215, text-figs. 130–131, pl. 52, figs. 1–2; Chace, 1940, p. 50.

Range: North Carolina; Florida Keys; northwest coast of Florida; north coast of Cuba; St. Christopher; Dominica; Barbados.

Depth: 206 to 530 m (107 to 290 fm).

Habitat: sand ooze, sand-mud, sand, and broken shell bottoms.

Remarks: Rathbun (1918) reported ovigerous females from North Carolina in October, from Florida in March, and from the Antilles in January-February.

Palicus dentatus (A. Milne Edwards, 1880) (Bull. Mus. Comp. Zool. 8: 28)

As ***Cymopolia dentata***—Rathbun, 1918, p. 202, text-fig. 124.
As ***Palicus dentatus***—Pequegnat, 1970, p. 197.

Range: Florida Keys; west coast of Florida; off Alabama; off Barbados.

Depth: 27 to 139 m (15 to 76 fm).

Habitat: coral and broken shell bottoms.

Palicus faxoni Rathbun, 1897 (Proc. Biol. Soc. Washington 11: 96)

As ***Cymopolia faxoni***—Rathbun, 1918, p. 194, text-fig. 120, pl. 45, 2–3.
As ***Palicus faxoni***—Williams, 1965, p. 216, fig. 201.

Range: North Carolina; east coast of Florida; northeast of Yucatan (Gulf); ? off Cape Frio, Brazil.

Depth: 59 to 93 m (32 to 51 fm).

Habitat: sand substrates.

Palicus gracilipes (A. Milne Edwards, 1880) (Bull. Mus. Comp. Zool. 8: 29)

As ***Cymopolia gracilipes***—Rathbun, 1918, p. 221, text-fig. 133, pl. 52, figs. 3–4; Chace, 1940, p. 51.

Range: Bahamas; north of Yucatan; north coast of Cuba.

Depth: 112 to 545 m (61 to 298 fm).
Habitat: sand and shell bottoms.

Palicus gracilis (Smith, 1883) (Proc. U.S. Nat. Mus. 6: 20)

As ***Cymopolia gracitis***—Rathbun, 1918, p. 218, text-fig. 132, pl. 50, pl. 51, fig. 1; Chace, 1940, p. 50.
As ***Palicus gracilis***—Pequegnat, 1970, p. 195, fig. 6–11.

Range: off Massachusetts; east coast of Florida; northwest Florida; Louisiana to central east coast of Mexico; north coast of Cuba; Curaçao.
Depth: 183 to 686 m (100 to 375 fm).
Habitat: fine sand and mud substrates.
Remarks: Chace (1956) reported this species in the Gulf of Mexico and Pequegnat (1970) reported ovigerous females from the same area in August and November. He further noted that this crab may be able to swim, but is probably not pelagic.

Palicus obesus (A. Milne Edwards, 1880) (Bull. Mus. Comp. Zool. 8: 27)

As ***Cymopolia obesa***—Rathbun, 1918, p. 205, text-fig. 125, pl. 49.
As ***Palicus obesus***—Pequegnat, 1970, p. 197.

Range: off northwest Florida and Mississippi; Campeche, Mexico.
Depth: 24 to 220 m (13 to 120 fm).
Remarks: Collected by the R/V *Oregon* from the northeastern Gulf of Mexico (Chace, 1956).

Palicus sica (A. Milne Edwards, 1880) (Bull. Mus. Comp. Zool. 8: 29)

As ***Cymopolia sica***—Rathbun, 1918, p. 208, text-fig. 127, pl. 40, figs. 3–4; Rathbun, 1933, p. 85, fig. 78; Chace, 1940, p. 49.
As ***Palicus sicus***—Milne Edwards & Bouvier, 1902, p. 56, pl. 10, figs. 7–11, pl. 11, fig. 9; Pequegnat, 1970, p. 198.

Range: Florida Keys and Straits; west coast of Florida; north coast of Cuba; Puerto Rico; Virgin Islands; Barbados; Grenada.
Depth: 27 to 348 m (15 to 190 fm).
Habitat: sand, mud, shell, and coral bottoms.
Remarks: Pequegnat (1970) reported ovigerous females from the Gulf of Mexico in mid-July. Rathbun (1918) described the colors of freshly-preserved specimens. Chace (pers. comm.) notes that the specific name *sica* is used as a noun in opposition (L. = curved dagger) and thus should not be changed due to the transfer of the species to the masculine genus *Palicus*.

Family PINNOTHERIDAE de Haan, 1833

Subfamily PINNOTHERINAE de Haan, 1833

Dissodactylus Smith, 1870

Dissodactylus alcocki Rathbun, 1918 (Bull. U.S. Nat. Mus. 97: 124)

Rathbun, 1918, p. 124, text-figs. 70–71, pl. 28, figs. 3–4; Schmitt, McCain & Davidson, 1973, p. 16.

Range: off delta of Mississippi River.
Depth: 64 m (35 fm).
Habitat: sand-mud bottom.
Remarks: This species is known only from a female type and a damaged male paratype.

Dissodactylus borradailei Rathbun. 1918 (Bull. U.S. Nat. Mus. 97: 121)

Rathbun, 1918, p. 121, text-fig. 68, pl. 27, figs. 5–8; Schmitt, McCain & Davidson, 1973, p. 16.

Range: off southeast and southwest coasts of Florida; Jamaica.
Depth: 49 to 55 m (27 to 30 fm).
Habitat: fine white sand.

Dissodactylus calmani Rathbun, 1918 (Bull. U.S. Nat. Mus. 97: 125)

Rathbun, 1918, p. 125, text-figs. 72–73, pl. 28, figs. 5–6; Schmitt, McCain & Davidson, 1973, p. 16.

Range: east coast of Florida; northwest coast of Cuba.
Depth: 4 to 7 m (2 to 4 fm).
Habitat: coral, sand, gravel, and rock bottoms; near shore.

Dissodactylus crinitichelis Moreira, 1901 (Arch. Mus. Nac. Rio de Janeiro 11: 37)

As ***D. encopei***—Rathbun, 1918, p. 119, text-fig. 67, pl. 27, figs. 1–4; Williams, McCloskey & Gray, 1968, p. 56, fig. 12.
As ***D. crinitichelis***—Rathbun, 1933, p. 83, fig. 76; Schmitt, McCain & Davidson, 1973, p. 17.

Range: off North Carolina; northwest coast of Florida; Jamaica; Puerto Rico; Belize; Caribbean coast of Colombia; Paraiba to Rio Grande do Sul, Brazil.
Depth: shore to 52 m (to 28 fm).
Habitat: fine white sand, coral, and broken shell bottoms; on *Halodule* (sea grass); with the echinoids *Encope marginata, E. michelini* (sand dollars) and *Clypeaster subdepressus* (sea biscuit).
Remarks: L. H. Hyman (1955) commented on host relationships with echinoids (as *D. encopei*). Listed from Florida by Wass (1955), Abele (1970), and Menzel (1971); listed from Brazil by Coelho and Ramos (1972) and Rodrigues da Costa (1971).

Dissodactylus encopei Rathbun, 1901.

A junior synonym of *D. crinitichelis* Moreira, 1901.

Dissodactylus juvenilis Bouvier, 1917 (Bull. Mus. Nat. Hist. Natur. Paris 23: 397)

Milne Edwards & Bouvier, 1923, p. 349, text-figs. 11–12, pl. 9, figs. 3–4; Schmitt, McCain & Davidson, 1973, p. 17.

Range: north of Yucatan, Mexico.

Dissodactylus mellitae (Rathbun, 1900) (Amer. Natural. 34: 590)

Hay & Shore, 1918, p. 444, pl. 36, fig. 1; Rathbun, 1918, p. 117, text-fig. 66, pl. 28,

figs. 7–8; Williams, 1965, p. 209, fig. 192; Williams, McCloskey & Gray, 1968, p. 57; Rogers, 1968, p. 318; Schmitt, McCain & Davidson, 1973, p. 18.

Range: Massachusetts to South Carolina; northwest coast of Florida; Texas.
Depth: 9 to 52 m (5 to 28 fm).
Habitat: sand and broken shell bottoms; areas of scattered sponges and coral heads; with the echinoids *Mellita quinquesperforata*, *Encope michelini*, *Echinarachinius parma*, and *Clypeaster subdepressus*.
Remarks: Larval stages have been described by O. W. Hyman (1924), Lebour (1928), Aikawa (1937) and Costlow and Bookhout (1966b). Host relationships were described by Johnson (1952), L. H. Hyman (1955), Gray (1961), Gray, McCloskey and Weihe (1968), and MacGinitie and MacGinitie (1968, p. 314). Regional lists include Florida (Wass, 1955; Abele, 1970; Menzel, 1971). Not listed by Felder (1973a) for Texas, but see Rogers (1968) for a report on this species at Galveston.

Dissodactylus primitivus Bouvier, 1917 (Bull. Mus. Nat. Hist. Natur. Paris 23: 394)

Milne Edwards & Bouvier, 1923, p. 346, text-fig. 8, pl. 8, figs. 3–4, pl. 9, fig. 1; Schmitt, McCain & Davidson, 1973, p. 20.

Range: west of Tortugas, Florida.
Remarks: The above location is the only known record for this species.

Dissodactylus stebbingi Rathbun, 1918 (Bull. U.S. Nat. Mus. 97: 123)

Rathbun, 1918, p. 123, text-fig. 69, pl. 28, figs. 1–2; Schmitt, McCain & Davidson, 1973, p. 20.

Range: Virginia; west and northwest coasts of Florida.
Depth: 9 to 10 m (17 fm).
Habitat: on sea biscuits, *Clypeaster subdepressus*, in an area of scattered sponges and coral heads (northwest Florida).
Remarks: Wass (1955) and Menzel (1971) provide some ecological notes on this crab.

Fabia Dana, 1851

Fabia byssomiae (Say, 1818) (J. Acad. Nat. Sci. Philadelphia 1: 451)

Rathbun, 1918, p. 105, text-fig. 56, pl. 24, figs. 6, 8; Schmitt, McCain & Davidson, 1973, p. 22.

Range: west coast of Florida; northwest coast of Cuba.
Depth: 4 to 9 m (2 to 5 fm).
Habitat: in bivalve molluscs, *Hiatella arctica*; located on beds of *Alcyonium* and between individuals of aggregating ascidians.

Fabia tellinae Cobb, 1973 (Crustaceana 25: 70)

Cobb, 1973, p. 70, figs. 1–2.

Range: off northwest Florida to Alabama.
Depth: 5 to 18 m (3 to 10 fm).
Habitat: commensal in bivalves, *Tellina magna* Spengler (females in mantle cavity, males in excurrent siphon); from sandy bottoms.

Orthotheres Sakai, 1969

Orthotheres serrei (Rathbun, 1909) (Bull. Mus. Hist. Nat. Paris 2: 69)

As ***Pinnotheres serrei***—Rathbun, 1918, p. 84, text-fig. 41, pl. 19, figs. 1–7; Rathbun, 1933, p. 82.
As ***Orthotheres serrei***—Sakai, 1969, p. 275; Schmitt, McCain & Davidson, 1973, p. 27.

Range: northwest Cuba; Jamaica; Puerto Rico.
Habitat: at surface; on reef flats; in mantle cavity of *Strombus*.

Orthotheres strombi (Rathbun, 1905) (Proc. Acad. Nat. Sci. Philadelphia 1905: 371)

As ***Pinnotheres strombi***—Rathbun, 1918, p. 90, text-fig. 45, pl. 20, figs. 1–2.
As ***Orthotheres strombi***—Sakai, 1969, p. 275; Schmitt, McCain & Davidson, 1973, p. 27.

Range: west and northwest coasts of Florida.
Habitat: commensal in the gastropods *Strombus pugilis*, *S. alatus*, and *Pleuroploca*.
Remarks: Listed from Florida by Wass (1955), Abele (1970), and Menzel (1971).

Parapinnixa Holmes, 1894

Parapinnixa bouvieri Rathbun, 1918 (Bull. U.S. Nat. Mus. 97: 111)

Rathbun, 1918, p. 111, text-fig. 60, pl. 25, figs. 4–10; Rathbun, 1933, p. 83, fig. 75; Williams, 1965, p. 208, fig. 191; Schmitt, McCain & Davidson, 1973, p. 31.

Range: South Carolina; northeast of Yucatan (Gulf); Puerto Rico.
Depth: 5 to 73 m (3 to 40 fm).
Habitat: coral and sand bottoms; among ventral spines of a sea urchin.
Remarks: Williams (1965) lists ovigerous females from Florida and notes the association of this crab with a sea urchin.

Parapinnixa hendersoni Rathbun, 1918 (Bull. U.S. Nat. Mus. 97: 109)

Rathbun, 1918, p. 109, text-fig. 59, pl. 26, figs. 1–5; Schmitt, McCain & Davidson, 1973, p. 32.

Range: west coast of Florida; northwest Cuba; Curaçao; Maranhão to Bahia, Brazil.
Depth: 38 to 55 m (21 to 30 fm).
Habitat: free-swimming, pelagic (Cuba, in Rathbun, 1918); on sand and broken coral bottom in Florida.
Remarks: Recorded from Brazil by Righi (1967) and Coelho and Ramos (1972).

Pinnaxodes Heller, 1865

Pinnaxodes floridensis Wells & Wells, 1961 (Bull. Mar. Sci. Gulf Carib. 11: 267)

Wells & Wells, 1961, p. 267, figs. 1–2; Schmitt, McCain & Davidson, 1973, p. 34.

Range: west and northwest coasts of Florida.

Habitat: commensal in the cloaca and respiratory tree of the holothurian, *Theelothuria princeps* (Selenlza), which buries in sand; juvenile crabs are found in the anterior digestive tract of the host.

Remarks: Wells and Wells (1961) provided data on the natural history, ecology, and morphology of this crab and Pearce (1966) reviewed the biology and host relationships. Abele (1970) listed the angel wing mollusc, *Cyrtopleura costata*, as a host for a sexual intermediate form of this crab. Listed from northwest Florida by Menzel (1971).

Pinnotheres Bosc, 1801–1802

Pinnotheres geddesi Miers, 1880 (J. Linn. Soc. London, Zool. 15: 86)

Rathbun, 1918, p. 70, text-fig. 32, pl. 16, figs. 1–4; Rathbun, 1933, p. 82; Schmitt, McCain & Davidson, 1973, p. 45.

Range: Veracruz, Mexico; eastern Cuba (Atlantic); Puerto Rico; ? Jamaica.

Habitat: commensal in mangrove oysters (? *Crassostrea rhizophorae*) and *Ostrea*.

Pinnotheres guerini H. Milne Edwards, 1853 (Ann. Sci. Nat. Zool. Paris 20: 219)

Rathbun, 1918, p. 101, text-fig. 52; Rathbun, 1933, p. 83; Schmitt, McCain & Davidson, 1973, p. 48.

Range: Cuba (location not specified); Puerto Rico.

Habitat: reported from oysters.

Remarks: The location of the type specimen in Cuba is unspecified, thus this species may not be present in the Gulf of Mexico.

Pinnotheres hemphilli Rathbun, 1918 (Bull. U.S. Nat. Mus. 97: 99)

Rathbun, 1918, p. 99, text-fig. 51, pl. 23; Schmitt, McCain & Davidson, 1973, p. 48.

Range: Cedar Keys, Florida.

Habitat: intertidal.

Remarks: Known only from a single type specimen.

Pinnotheres hirtimanus H. Milne Edwards, 1853 (Ann. Sci. Nat. Zool. Paris 20: 219)

Rathbun, 1918, p. 101; Schmitt, McCain & Davidson, 1973, p. 48.

Range: Cuba, location unspecified.

Remarks: Known only from the single type specimen.

Pinnotheres maculatus Say, 1818 (J. Acad. Nat. Sci. Philadelphia 1: 450)

Common Names: Mussel Crab; Pea Crab

Hay & Shore, 1918, p. 443, pl. 35, fig. 10; Rathbun, 1918, p. 74, text-figs. 35–36, pl. 17, figs. 3–6; Rathbun, 1933, p. 82, fig. 74; Williams, 1965, p. 206, fig. 190; Felder, 1973a, p. 74, pl. 10, figs. 10–11; Schmitt, McCain & Davidson, 1973, p. 53.

Range: Massachusetts to south Florida; west coast of Florida to Texas; northwest Cuba; Jamaica; Puerto Rico; Virgin Islands; Uruguay and Argentina.

Depth: surface to 50 m (to 27 fm).

Habitat: commensal in a variety of bivalve molluscs; young of both sexes and often adult males are free-swimming; most common in the mantle cavities of mussels, *Mytilus edulis*; in tubes of the polychaetes *Arenicola* and *Chaetopterus* (*C. pergamentaceus* and *C. variopedatus*); from mud, sand, shell and gravel substrates. Other molluscan hosts include: *Atrina rigida, A. seminuda, A. serrata, Anomia simplex, Argopecten gibba, A. irradians, Cyrtopleura costata, Modiolus modiolus, M. tulipa, Mya arenaria,* and *Placopecten magellanica.*

Remarks: This species has a large literature, catalogued by Schmitt, McCain and Davidson (1973). Larval stages were described by O. W. Hyman (1924), Aikawa (1937) and Costlow and Bookhout (1966b). Life history data is provided in MacGinitie and MacGinitie (1968) and by Christensen and McDermott (1959). Caine (1975) studied feeding behavior and physiology and Kruczynski (1975) measured food intake and digestion. Pearce (1964) described reproductive aspects. Larval shadow responses were studied by Forward (1977) and behavior in relation to hosts was described by Sastry and Menzel (1962) and by Eidemiller (1969). The effects of this crab on the growth and biology of its scallop hosts were studied by Kruczynski (1971, 1972). Sandifer (1973) commented on larval ecology in Virginia and Fotheringham and Brunenmeister (1975) described this crab as it occurs in the Gulf of Mexico. Regional lists include Florida (Wass, 1955; Tabb and Manning, 1961; Abele, 1970; Menzel, 1971; Godcharles and Jaap, 1973) and Texas (Leary, 1967). Listed from Brazil by Rodrigues da Costa (1971) and Coelho and Ramos (1972).

Pinnotheres moseri Rathbun, 1918 (Bull. U.S. Nat. Mus. 97: 94)

> Rathbun, 1918, p. 94, text-fig. 47, pl. 21, figs. 3–4; Schmitt, McCain & Davidson, 1973, p. 58.

Range: west coast of Florida.

Depth: 1.5 to 5.5 m (1 to 3 fm).

Habitat: commensal in sea squirts (tunicates) and from the brachial cavity of an ascidian, *Polycarpa obtecta*; off rocky bottoms with grass and thin layers of sand and mud.

Remarks: Rathbun (1918) did not list sea squirts as commensals, only as present in the dredges in which the crabs were found. Pearce (1966) provided information on life history and Hartnoll (1964a) described a larval stage. Listed from Florida by Godcharles and Jaap (1973), including data from the collection locality.

Pinnotheres ostreum Say, 1817 (J. Acad. Nat. Sci. Philadelphia 1: 67)

Common Names: Oyster Crab; Common Pea Crab

> Hay & Shore, 1918, p. 543, pl. 35, fig. 9; Rathbun, 1918, p. 66, text-fig. 30, pl. 15, figs. 3–6; Williams, 1965, p. 203, figs. 187–189; Felder, 1973a, p. 75, pl. 10, figs. 12–14; Schmitt, McCain & Davidson, 1973, p. 61.

Range: Massachusetts to south Florida; Texas; northwest Cuba; Guadeloupe; Pernambuco to Santa Catarina, Brazil.

Habitat: parasitic in oysters and present in other bivalve molluscs, including: *Crassostrea virginica, C. rhizophorae, Anomia simplex, Mytilus edulis,* and

Pecten spp.; occasionally in polychaete (*Chaetopterus*) tubes; only the first crab ("invasive") stage is free-swimming; found primarily in shallow bays and other suitable oyster habitats.

Remarks: The large literature on this species was catalogued by Schmitt, McCain and Davidson (1973). Earlier biologists thought that this crab was a commensal of oysters, but its parasitic nature was definitely established, as summarized by Stauber (1945), Flower and McDermott (1953) and Haven (1958). Information on larval stages can be found in O. W. Hyman (1924), Lebour (1928), Aikawa (1937), Costlow and Bookhout (1966b) and in Sandoz and Hopkins (1947). Natural history of this species is reviewed by Christensen and McDermott (1959) and by MacGinitie and MacGinitie (1968); Williams (1965) summarized much of the current literature. Beach (1969) studied the life history of this crab in North Carolina. Hartnoll (1971) noted modifications for swimming activity. Listed from Texas by Hedgpeth (1953), Breuer (1962) and Leary (1967).

Pinnotheres serrei Rathbun, 1909.

Transferred to a new genus, *Orthotheres*, by Sakai (1969). Refer to *Orthotheres serrei.*

Pinnotheres shoemakeri Rathbun, 1918 (Bull. U.S. Nat. Mus. 97: 95)

Rathbun, 1918, p. 95, text-fig. 48, pl. 22, figs. 1–4; Rathbun, 1933, p. 83; Schmitt, McCain & Davidson, 1973, p. 86.

Range: west coast of Florida; St. Thomas, Virgin Islands.

Pinnotheres strombi Rathbun, 1905.

Transferred to a new genus, *Orthotheres*, by Sakai (1969). Refer to *Orthotheres strombi.*

Subfamily PINNOTHERELIINAE Alcock, 1900

Pinnixa White, 1846

Pinnixa chacei Wass, 1955 (Quart. J. Flor. Acad. Sci. 18: 160)

Wass, 1955, p. 160, figs. 5–9; Felder, 1973a, p. 71, pl. 10, fig. 5; Schmitt, McCain & Davidson, 1973, p. 104.

Range: northwest Florida; Louisiana and Texas.

Habitat: intertidal, commensal with burrowing shrimp, *Callinassa islagrande*, living in upper part of burrow; on sandy bottoms.

Remarks: Listed from Florida by Wass (1955) and Menzel (1971), from Louisiana by Behre (1950) as *Pinnixa* sp., and from Texas (Leary, 1967).

Pinnixa chaetopterana Stimpson, 1860 (Ann. Lyc. Nat. Hist. New York 7: 235)

Hay & Shore, 1918, p. 445, pl. 36,fig. 4; Rathbun, 1918, p. 151, text-figs. 93–94, pl. 33, figs. 3–6; Williams, 1965, p. 210, fig. 194; Felder, 1973a, p. 74, pl. 10, fig. 8; Schmitt, McCain & Davidson, 1973, p. 104.

Range: Massachusetts to Florida; northwest Florida to Texas; Pernambuco to Rio Grande do Sul, Brazil.

Depth: shore to 16 m (to 9 fm).

Habitat: mud, shell, and gravel bottoms; there are two forms of this crab along the northern Gulf coast: the larger is a commensal with the polychaetes *Amphitrite ornata* and *Chaetopterus variopedatus*, living inside the tubes of the hosts; the smaller form occupies the upper portion of burrows of *Callinassa jamaicense louisianensis*.

Remarks: Larval stages were described by O. W. Hyman (1924), Lebour (1928), and Aikawa (1937). Sandifer (1973) noted aspects of larval ecology in Virginia. Williams (1965) summarized current literature on this species and MacGinitie and MacGinitie (1968) provided a general account of its life history. Johnson (1952) described a "host factor" for this crab. Behavioral studies include Pearse (1913) and Gray (1961), including notes on symbiotic relationships. Craig (1974) measured temperature tolerances and oxygen consumption. Listed from Florida by Wass (1955), Menzel (1971), and Godcharles and Jaap (1973) and from Mississippi by Richmond (1962) and Christmas and Langley (1973). Listed from Brazil by Righi (1967), Rodrigues da Costa (1971) and Coelho and Ramos (1972).

Pinnixa cristata Rathbun, 1900 (Amer. Natural. 34: 589)

Hay & Shore, 1918, p. 446, pl. 36, fig. 5; Rathbun, 1918, p. 134, text-fig. 78, pl. 29, figs. 8–9; Williams, 1965, p. 210, fig. 193; Felder, 1973a, p. 74, pl. 10, fig. 6; Schmitt, McCain & Davidson, 1973, p. 106.

Range: North and South Carolina; Louisiana and Texas.

Habitat: intertidal beaches; shallow sand and sand-mud substrates of brackish to marine waters; usually commensal with callinassid shrimps and other burrowers.

Remarks: Hedgpeth (1950) described these crab from salt flats that border the bays and intercoastal waterways of Texas. MacGinitie and MacGinitie (1968) included information on the ecology of this species. Listed from Louisiana by Behre (1950).

Pinnixa cylindrica (Say, 1818) (J. Acad. Nat. Sci. Philadelphia 1: 452)

Hay & Shore, 1918, p. 446, pl. 36, fig. 3; Rathbun, 1918, p. 159, text-fig. 99, pl. 35, figs. 5, 8; Milne Edwards & Bouvier, 1923, p. 345; Williams, 1965, p. 213, fig. 197; Schmitt, McCain & Davidson, 1973, p. 106.

Range: Massachusetts to South Carolina; west and northwest coasts of Florida.

Depth: shallow water to 37 m (to 20 fm).

Habitat: commensal with *Arenicola cristata* (lugworm) in the non-tubular burrows; young crabs occur near the intertidal zone of slimy shores.

Remarks: McDermott (1962) provided a general account of this species, which is also summarized by Williams (1965). Sandifer (1973) commented on larval ecology in Virginia. Listed by Menzel (1971) from northwest Florida.

Pinnixa floridana Rathbun, 1918 (Bull. U.S. Nat. Mus. 97: 138)

Rathbun, 1918, p. 138, text-fig. 82, pl. 30, figs. 4–7; Williams, McCloskey & Gray, 1968, p. 57, fig. 13; Schmitt, McCain & Davidson, 1973, p. 110.

Range: North Carolina; west and northwest coasts of Florida.

Habitat: shallow water, possibly in tubes of the polychaete, *Diopatra cuprea*; collected from a compound ascidian growing on a soft coral; from under rocks in 10 feet of water.

Remarks: Rathbun (1918) commented on morphological variation between the sexes of this species. Listed from Florida by Wass (1955) and Menzel (1971).

Pinnixa leptosynaptae Wass, 1968 (Tulane Stud. Zool. 14: 137)

Wass, 1968, p. 137, figs. 1–6; Schmitt, McCain & Davidson, 1973, p. 112.

Range: west coast of Florida.

Habitat: found on the surface of the holothurian *Leptosynapta crassipatina.*

Remarks: Listed from northwest Florida by Menzel (1971).

Pinnixal lunzi Glassell, 1937 (Charleston Mus. Leaflet 9: 3)

Glassell, 1937, p. 3, figs. 1–8; Williams, 1965, p. 214, figs. 198–199; Felder, 1973a, p. 71, pl. 10, fig. 4; Schmitt, McCain & Davidson, 1973, p. 114.

Range: Virginia to Georgia; Mississippi to Texas.

Depth: near shore to 22 m (to 12 fm).

Habitat: on beaches, under drift material; in burrows of echiurans (*Thalassema hartmani*) and possibly other burrowers.

Remarks: Boesch (1971) listed this crab from an echiuran burrow in Virginia. Felder (1973b) reported a specimen taken from a red snapper stomach from a reef off Texas.

Pinnixa pearsei Wass, 1955 (Quart. J. Flor. Acad. Sci. 18: 164)

Wass, 1955, p. 164, figs. 10–13; Schmitt, McCain & Davidson, 1973, p. 116.

Range: northwest coast of Florida.

Habitat: commensal in tubes of the polychaete, *Diopatra*, from sand-mud beaches.

Remarks: Listed from northwest Florida by Abele (1970) and Menzel (1971). Although Menzel (1971) listed this crab as a commensal of an undetermined annelid, Abele (1970) stated that the crab does not seem to be restricted to commensal relationships where it was common in the sand-mud intertidal zone of Alligator Harbor's south shore.

Pinnixa retinens Rathbun, 1918 (Bull. U.S. Nat. Mus. 97: 139)

Rathbun, 1918, p. 139, text-figs. 83–84, pl. 41, figs. 1–2; Williams, 1965, p. 212, fig. 196; Felder, 1973a, p. 74, pl. 10, fig. 7; Schmitt, McCain & Davidson, 1973, p. 118.

Range: Chesapeake Bay; west coast of Florida; Texas.

Depth: low tide mark to 37 m (to 20 fm).

Habitat: mud bottoms of estuarine and marine waters; from burrows of the callinassid shrimp, *Upogebia affinis.*

Remarks: Rathbun (1918) believed this crab to be allied with *P. floridana.* Listed from Florida by Wass (1955) and Menzel (1971). Williams (1965) included this species in the Carolina fauna, even though it hadn't yet been collected from that area. Based on the wide range of locales but paucity of specimens, it is probably a rare species.

Pinnixa sayana Stimpson, 1860 (Ann. Lyc. Nat. Hist. New York 7: 236)

Hay & Shore, 1918, p. 446, pl. 36, fig. 3; Rathbun, 1918, p. 156, text-fig. 98, pl. 34, figs. 2–4; Williams, 1965, p. 212, fig. 195; Felder, 1973a, p. 74, pl. 10, fig. 9; Schmitt, McCain & Davidson, 1973, p. 119.

Range: Massachusetts to North Carolina; west coast of Florida; Louisiana; Amapá to São Paulo, Brazil.

Depth: surface to 75 m (to 41 fm).

Habitat: free-swimming; on sandy beaches in drift material; from mud bottoms; in tubes of lugworm, *Arenicola cristata*.

Remarks: Larval descriptions include O. W. Hyman (1924), Lebour (1928), and Aikawa (1929, 1937). Regional lists include Louisiana (Behre, 1950). Schmitt, McCain and Davidson (1973) note that the host record of *Arenicola* may be due to synonymy of *P. sayana* with *P. cylindrica* by Hay and Shore (1918) and so may be in error. Listed from Brazil by Righi (1967), Rodrigues da Costa (1968a), Coelho (1971a) and Coelho and Ramos (1972).

Family GRAPSIDAE, Macleay, 1838

Subfamily GRAPSINAE Macleay, 1838

Geograpsus Stimpson, 1858

Geograpsus lividus (H. Milne Edwards, 1837) (Hist. Nat. Crust., vol. 2. p. 85)

Rathbun, 1918, p. 234, pl. 55; Rathbun, 1933, p. 87, fig. 80; Garth, 1965a, p. 26; Forest & Guinot, 1966, p. 91; Chace & Hobbs, 1969, p. 157, figs. 48, 52a–c.

Range: Bermuda; Florida Keys, north and south coasts of Cuba; Jamaica; Puerto Rico; Virgin Islands to Barbados; Netherlands Antilles to Trinidad; Old Providence Island (Carib.); Caribbean coast of Colombia to São Paulo, Brazil; eastern Atlantic, from Senegal to Angola; Cape Verde Islands; eastern Pacific, from southern part of Baja California to northern Chile; Clipperton Island; Galapagos Islands; Hawaiian Islands.

Habitat: supralittoral, near the splash zone of rocky areas and stone beaches; from middle to upper intertidal, beneath stones.

Remarks: Hartnoll (1965b) provided ecological notes on populations in Jamaica. Chace and Hobbs (1969) commented on ecology of this crab in Dominica. Listed from Brazil by Coelho and Ramos (1972) and Fausto Filho (1974).

Goniopsis de Haan, 1833

Goniopsis cruentata (Latreille, 1803) (Hist. Nat. Crust., vol. 6, p. 70)

Common Names: Mangrove Crab; Tree Crab

Rathbun, 1918, p. 237, text-fig. 136, pl. 57; Rathbun, 1933, p. 87, fig. 81; Chace, 1940, p. 52; Bott, 1955a, p. 62; Holthuis, 1959, p. 235, figs. 59–60; Forest & Guinot, 1966, p. 91; Chace & Hobbs, 1969, p. 160, figs. 49, 52d–f; Felder, 1973a, p. 78, pl. 11, figs. 8–9.

Range: Bermuda; Bahamas; northwest Florida (rare); Tampico, Mexico; north and south coasts of Cuba; Jamaica; Hispaniola; Puerto Rico; Virgin Is-

lands to Barbados; Netherlands Antilles; Belize; Old Providence Island (Carib.); Surinam to Rio de Janeiro, Brazil; eastern Atlantic, from Senegal to northern Angola.

Habitat: mangrove swamps, along roots and on trunks of trees; on wet muddy marine shores, along inlets and estuaries; intertidal to supratidal.

Remarks: Leary (1967) listed this species from Texas, based on a collection by Hildebrand in 1958, but its occurrence along the Gulf coast is scattered and rare. Ecological studies include field work in Jamaica (Hartnoll, 1965b; Warner, 1969) and Dominica (Chace and Hobbs, 1969). Behavioral data is provided by Schone and Schone (1963), Schone (1968), and Warner (1970). Physiological studies include data on thoracic neurosecretion (Maynard, 1961a, 1961b; Maynard and Maynard, 1962) and coagulation (Morrison and Morrison, 1952). Listed from Brazil by Coelho and Ramos (1972).

Grapsus Lamarck, 1801

Grapsus grapsus (Linnaeus, 1758) (Syst. Nat., ed. 10, vol. 1, p. 630)

Common Names: Rock Crab; Cliff Crab; Sally Lightfoot

> Rathbun, 1918, p. 227, text-fig. 135, pls. 53–54; Rathbun, 1933, p. 86, fig. 79; Garth, 1965, p. 25; Forest & Guinot, 1966, p. 90; Chace & Hobbs, 1969, p. 163, figs. 50, 52g–i; Felder, 1973a, p. 78, pl. 11, fig. 15.

Range: Bermuda; Bahamas; southeast and south Florida; Texas; north and south coasts of Cuba; Jamaica; Puerto Rico; Hispaniola; Virgin Islands to Barbados; Netherlands Antilles to Trinidad; Old Providence Island and Swan Island (Carib.); Colombia to northern Brazil; eastern Atlantic, from Portugal to Angola; Cape Verde Islands and Azores; St. Helena Island; Ascension Island; eastern Pacific, from central Baja California to central Chile; Galapagos Islands; Clipperton Island.

Habitat: intertidal and supratidal zones of rocky areas, stone beaches, and sea walls; within reach of splash from surf and wave action; in crevices and cracks of rock cliffs near water's edge.

Remarks: Reports of this crab in the Gulf of Mexico are confined to the north coast of Cuba and from the rock jetties of Texas, where they are rare. Listed from Texas by Leary (1967), based on collections by Hildebrand. Also recorded from Brazil by Coelho and Ramos (1972) and Fausto Filho (1974). Ecological studies include those of Hartnoll (1965b) in Jamaica, Chace and Hobbs (1969) in Dominica, and Johnson (1965) on the relation of behavior to development and ecology. Social behavior was studied by Wright (1966, 1968), Schone and Eibl-Eibesfeldt (1965), Kramer (1967), Schone (1968), and Eibl-Eibesfeldt (film, 1963). Hartnoll (1971) noted the ability of this crab to swim. Physiological and anatomical studies include work on gill anatomy (Chen, 1933), coagulation (Morrison and Morrison, 1952), thoracic neurosecretion (Maynard, 1961a, 1961b; Maynard and Maynard, 1962), and neural fine structure (Skobe and Nunnemacher, 1970).

Pachygrapsus Randall, 1840

Pachygrapsus gracilis (Saussure, 1858) (Mém. Soc. Phys. Hist. Nat. Genève 15: 443)

Common Name: Wharf Crab

Rathbun, 1918, p. 249, pl. 60, fig. 3, pl. 61, fig. 1; Rathbun, 1933, p. 89; Holthuis, 1959, p. 239, pl. 10, fig. 3; Forest & Guinot, 1966, p. 92; Chace & Hobbs, 1969, p. 167, figs. 51, 52j; Felder, 1973a, p. 79, pl. 11, figs. 3–4, 11.

Range: Bermuda; Bahamas; south Florida; Texas; north and south coasts of Cuba; Jamaica; Puerto Rico; Virgin Islands; Caribbean coast of Columbia; Pernambuco to Bahia, Brazil; eastern Atlantic, from Senegal to Zaire.

Habitat: mangrove roots; along river banks near the sea; on pilings, wharves, stone jetties; rocky areas, just above the water level; intertidal to near supratidal.

Remarks: Extensive notes on the natural history of this crab in Jamaica were provided by Hartnoll (1965b) and by Warner (1969). Felder (1973a) listed some collection localities in Texas, but it is absent from collection lists of west Florida, Mississippi, and Louisiana. Listed from Brazil by Coelho and Ramos (1972).

Pachygrapsus transversus (Gibbes, 1850) (Proc. Amer. Assoc. Adv. Sci. 3: 181.

Common Name: Mottled Shore Crab

Hay & Shore, 1918, p. 447, pl. 36, fig. 9; Rathbun, 1918, p. 244, pl. 61; Rathbun, 1933, p. 88, fig. 82; Williams, 1965, p. 217, fig. 202; Forest & Guinot, 1966, p. 91; Chace & Hobbs, 1969, p. 169, fig. 52k; Felder, 1973a, p. 79, pl. 11, figs. 5, 10.

Range: North Carolina; Bermuda; Bahamas; east coast of Florida; Florida Keys and Dry Tortugas; Louisiana to east coast of Mexico; north coast of Cuba; Jamaica; Hispaniola; Puerto Rico; St. Thomas, Virgin Islands to Barbados; Trinidad; Netherlands Antilles; Bahia, Brazil to Uruguay; eastern Atlantic, from Mediterranean Sea to Angola; eastern Pacific, from central California to Peru; Galapagos Islands; Easter Island.

Habitat: mainly in rocky areas near the tideline; beneath stones and on wharves and pilings; occasionally found among mangrove roots and on sandy beaches.

Remarks: Leobur (1944) figured some of the larval stages. Ecological studies include Hartnoll (1965b) in Jamaica and Verrill (1908) in Bermuda. Listed from Louisiana (Behre, 1950) and Texas (Whitten, Rosene and Hedgpeth, 1950; Leary, 1967). Pearse (1932a) reported a protozoan from the gill cavity of this crab. Hazlett (1971) studied antennule chemosensivity and Alves (1974) tested salinity tolerances. Listed from Brazil by Coelho and Ramos (1972) and Fausto Filho (1974).

Planes Bowdich, 1825

Planes cyaneus Dana, 1852 (Proc. Acad. Nat. Sci. Philadelphia 5: 250)

As ***P. minutus***—Barnard, 1950, p. 120.

As ***P. cyaneus***—Chace, 1951, pp. 65–103, figs. 1b, 2b, 2e, 2h, 2m–o, 3i–n; Chace 1966, p. 646; Sakai, 1965, p. 197, pl. 93, figs. 3–4; Felder, 1973a, p. 78, pl. 11, fig. 1.

Range: rare occurrence in Texas; south Atlantic, at St. Helena Island and off west coast of Africa; throughout eastern Pacific and westward to the northwestern Pacific and Indian Ocean.

Habitat: pelagic, on floating objects, debris, and gulfweed; open ocean, but occasionally washed up with flotsam onto beaches.

Remarks: Chace (1951) provided a definitive taxonomic review, but this crab was considered at that time to be confined to the Pacific Ocean. In 1966, Chace reported it from St. Helena Island in the south Atlantic and noted that Barnard's (1950) citations of *P. minutus* from South Africa may have been partly or entirely records of *P. cyaneus*. Crosnier (1967) reported this crab from West Africa. Shirley (1974) found two specimens washed up on the beaches at Padre Island, Texas, in driftwood. This species should be considered extralimital for the Gulf of Mexico, although re-examination of *Planes* in collections may reveal additional specimens of this species.

Subfamily PLAGUSIINAE Dana, 1851

Percnon Gistel, 1848

Percnon gibbesi (H. Milne Edwards, 1853) (Ann. Sci. Nat. ser. 3, Zool. 20: 146 and 180)

Common Name: Spray Crab

Rathbun, 1918, p. 337, pl. 105; Rathbun, 1933, p. 93; fig. 88; Schmitt, 1939, p. 24; Garth, 1965, p. 34; Williams, 1965, p. 224.

Range: North Carolina, Bermuda; Bahamas, south Florida; Florida Keys; north coast of Cuba; Jamaica; Puerto Rico; Colon, Panama; Brazil; eastern Atlantic, from the Azores to South Africa; eastern Pacific, from Baja California to Chile; Galapagos Islands; Clipperton Island.

Habitat: low tide zone of rocky areas; surf zone, on rock and pebble bottoms, commensal with *Diadema* in Puerto Rico.

Remarks: Rathbun (1918) questioned the inclusion of the Pacific and Atlantic populations of this crab into one species, but subsequent authors have treated them as identical. Verrill (1908) commented on this crab in Bermuda and Hartnoll (1965b) described its biology and ecology in Jamaica. Garth (1946) described it from the Galapagos Islands. Schmitt (1939) provided the key characters for the genus. The habitat and color of Brazilian specimens was provided by Fausto Filho (1974).

Plagusia Latreille, 1806

Plagusia depressa (Fabricius, 1775) (Syst. entom., 1775), p. 406

Common Name: Cliff Crab

Rathbun, 1918, p. 332, text-fig. 154, pl. 101; Rathbun, 1933, p. 93, fig. 87; Monod,

1956, p. 455, figs. 614–617; Williams, 1965, p. 223, fig. 207; Forest & Guinot, 1966, p. 93; Chace & Hobbs, 1969, p. 192, figs. 62r–t, 63; Felder, 1973a, p. 75, pl. 11, fig. 13.

Range: North and South Carolina; Bermuda; Florida Keys and Dry Tortugas; Texas; Cuba; Jamaica; Hispaniola; Puerto Rico; Virgin Islands; Dominica to Barbados; Trinidad; Netherlands Antilles; Ceará to Pernambuco, Brazil; eastern Atlantic, from the Azores and Madeira and Senegal to Angola.

Habitat: in fissures and crevices of rocks; in tide pools; on jetties; intertidal.

Remarks: Chace and Hobbs (1969) provided notes on color patterns of living crabs. Haratnoll (1965b) studied the ecology of this crab in Jamaica and notes on swimming behavior were given in Hartnoll (1971). Physiological studies include Morrison and Morrison (1952) on coagulation and data on thoracic neurosecretion (Marynard, 1961a, 1961b; Maynard and Maynard, 1962). Listed from Brazil by Coelho (1971a), Coelho and Ramos (1972), and Fausto Filho (1974).

Subfamily SESARMINAE Dana, 1852

Aratus H. Milne Edwards, 1853

Aratus pisonii (H. Milne Edwards, 1837) (Hist. Nat. Crust., vol. 2: 76)

Common Names: Mangrove Crab; Tree Crab

Rathbun, 1918, p. 323, pl. 96; Rathbun, 1933, p. 92, fig. 85; Chace & Hobbs, 1969, p. 172, figs. 54, 58a.

Range: Bahamas; southeast to southwest Florida; north and south coasts of Cuba; New Providence Island (Atlantic); Jamaica; Puerto Rico; Virgin Islands to Guadeloupe; Netherlands Antilles; Belize; Rio Parahyba do Norte to São Paulo, Brazil; Nicaragua to Peru, in eastern Pacific.

Habitat: along shores of estuaries and near fresh, brackish or marine waters; on rocks, piles, and wharves; commonly in mangroves, on which this crab can easily climb.

Remarks: Warner (1968) described larval development. Hartnoll (1965b) provided extensive notes on the biology of this crab in Jamaica, including ecology, growth, feeding, behavior, and reproduction. Warner (1967, 1969, 1970) also studied this species in Jamaica. Hartnoll (1971) briefly commented on swimming activity. Listed from south Florida by Tabb and Manning (1961) and from Brazil by Coelho and Ramos (1972).

Cyclograpsus H. Milne Edwards, 1837

Cyclograpsus integer H. Milne Edwards, 1837 (Hist. Nat. Crust., vol. 2: 79)

Common Name: Marsh Crab

Rathbun, 1918, p. 326, pl. 97, figs. 1–2; Rathbun, 1933, p. 92, fig. 86; Monod, 1956, p. 451, figs. 609–612; Chace & Hobbs, 1969, p. 173, figs. 55, 58b–d; Felder, 1973a, p. 75, pl. 11, figs. 12, 14.

Range: Bermuda; Bahamas; south Florida; Florida Keys; Texas; Cuba; Jamaica; Hispaniola; Puerto Rico; St. Croix; Dominica; Islas Los Roques and

Caribbean coast of Colombia; Ceará to Pernambuco, Brazil; eastern Atlantic, from Senegal to Zaire.

Habitat: burrows in marshy marine areas; among rocky and stony areas of the intertidal zone and up to the high tide line.

Remarks: Felder (1973a) provided the only other specific Gulf record in addition to the previous record for the Florida Keys. Hartnoll (1965b) commented on the ecology of this crab in Jamaica. Listed from Brazil by Coelho and Ramos (1972) and Fausto Filho (1974).

Sesarma Say, 1817

Subgenus ***Holometopus*** H. Milne Edwards, 1853

Sesarma (Holometopus) americanum Saussure, 1858 (Mém. Soc. Hist. Nat. Genève 14: 441)

As ***S. tampicense***—Rathbun, 1918, p. 307, text-fig. 151, pl. 88,
As ***S. americanum***—Chace & Hobbs, 1969, p. 178, figs. 62a–f.

Range: Tampico, Mexico; St. Thomas, Virgin Islands.

Habitat: soft mud, along river banks.

Remarks: Chace and Hobbs (1969) determined that *S. tampicense* Rathbun was a junior synonym of *S. americanum* Saussure. Behre (1950) tentatively listed the species from Louisiana (as *S. tampicense*), but noted that Chace had examined the specimens and preferred not to record the species as indicated. Abele (1972b) mentions the similarities between several of the western Atlantic members of the genus; he notes the distinct differences between *S. angustipes* Dana and *S. americanum*.

Sesarma (Holometopus) angustipes Dana, 1852.

This species was restricted by Abele (1972b) to the specimens from Brazil and Trinidad; refer to his paper for a discussion of synonymy. Material listed under this name by Rathbun (1918, p. 331) was synonymized with *S. roberti* by Chace and Hobbs (1969, p. 184).

Sesarma (Holometopus) benedicti Rathbun, 1897 (Proc. Biol. Soc. Washington 11: 90)

Rathbun, 1918, p. 316, pl. 93; Holthuis, 1959, p. 248, fig. 62; Abele, 1973, p. 379, figs. 1A, 1G.

Range: Key West, Florida; Guyana and Surinam; Brazil.

Habitat; under wood and stones on banks of brackish and almost freshwater streams.

Remarks: The female specimen from Key West (MCZ 6236) listed by Rathbun (1918) is the only Gulf of Mexico record; all others are from South America. Ecological notes were provided by Holthuis (1959).

Sesarma (Holometopus) cinereum (Bosc, 1802) (Hist. Nat. Crust., vol. 1, an X, p. 204)

Common Names: Square-backed Fiddler; Wharf Crab; Wood Crab; Friendly Crab

As ***S. cinerea***—Hay & Short, 1918, p. 449, pl. 36, fig. 11.
As ***S. cinereum***—Rathbun, 1918, p. 300, text-fig. 149, pl. 83; Williams, 1965, p. 222, fig. 206; Felder, 1973a, p. 78, pl. 11, fig. 6; Abele, 1973, p. 377, figs. 1B, 1H.

Range: Maryland to southeast Florida; southwest Florida to Vera Cruz, Mexico.

Habitat: on wharves, pilings, and other wooden objects; stone jetties and rocky areas; in *Spartina* marshes and along the edges of mangrove swamps; burrows from the high tide mark to well inland in mud and sand substrates; frequently found on boats and ships.

Remarks: Abele (1973) states that previous records of *S. cinereum* from the West Indies and elsewhere in the Caribbean were based on juvenile specimens of *S. ricordi* and *S. americanum*. Regional lists include Florida (Wass, 1955; Menzel, 1971; Subrahmanyam *et al.*, 1976), Mississippi (Richmond, 1968), Louisiana (Behre, 1950; Hoese and Valentine, 1972) and Texas (Hedgpeth, 1953; Leary, 1967). Hedgpeth (1953) presented a map, showing the ranges of *Sesarma* in the northern Gulf of Mexico. Williams (1965) listed ovigerous females from North Carolina in May to November and from the mouth of the Potomac River in January. Abele (1973) collected ovigerous females from Florida in June and from Texas in July. Sandifer (1973) commented on larval abundance in Virginia.

Larval development was studied by Costlow, Bookhout and Monroe (1960) and Costlow and Bookhout (1960b). Ecological notes were provided by Williams (1965) and by Fotheringham and Brunenmeister (1975). Physiological studies include observations on gill area (Gray, 1957), oxygen consumption (Teal, 1959), and tolerance to dilute salt water (Pearse, 1929). Observations on the behavior of this crab in captivity were made by Oler (1941) and by Duncker (1934).

Sesarma (Holometopus) miersii Rathbun, 1897 (Proc. Biol. Soc. Washington 11: 91)

Rathbun, 1918, p. 303 (part), pl. 84; Chace & Hobbs, 1969, p. 180, figs. 59, 62g–i; Abele, 1972b, p. 166, figs. 1B, 1C, 2B, 2C; Abele, 1973, p. 380, fig. 1I.

Range: Bahamas; Key West, Florida; south coast of Cuba; Swan Island (Carib.); Dominica.

Habitat: marshy tidal flats.

Remarks: Abele (1972b) reviewed the status of this crab and the confusion in nomenclature that existed from Rathbun's (1897) description of Mier's original material. Only the original specimens from the Bahamas became the type material for this species. Specimens from Brazil in Rathbun (1918) are now designated *S. angustipes* and the specimen from Uruguay is *Metasesarma rubripes*. Hartnoll (1965b) found no evidence of *S. miersii* in Jamaica and later authors agree that the observations of Andrews cited in Rathbun (1918, p. 304) refer to *S. roberti* (see Abele, 1973). The only Gulf of Mexico record is that from Key West (Abele, 1973).

Sesarma (Holometopus) ricordi H. Milne Edwards, 1853 (Ann. Sci. Nat., ser. 3, Zool. 20: 183)

Common Name: Beach Crab

Rathbun, 1918, p. 309 (part), pl. 89; Rathbun, 1933, p. 91; Holthuis, 1959, p. 246, pl. 11, fig. 3; Chace and Hobbs, 1969, p. 183, fig. 62k; Abele, 1973, p. 378, fig. 1J.

Range: Bermuda; Bahamas; southeast Florida; Florida Keys; west coast of Florida; north coast of Yucatan; Cuba; Jamaica; Hispaniola; Puerto Rico; Virgin Islands to Trinidad; Curaçao; Old Providence Island (Carib.); Yucatan to Surinam.

Habitat: from intertidal zone to about 50 meters inland; in low-lying pine woods; edges of mangrove swamps; burrows in grassy areas above sandy beaches; under driftwood and among rocks, along shorelines.

Remarks: Previous records of this species from Mississippi have been identified as *S. cinereum* by Chace (in Hedgpeth, 1953) and the material from Brazil was determined to be *S. angustipes* by Abele (1972b). Abele (1973) listed ovigerous females from Florida in May, June and August and from Panama in January. Larval development was studied by Diaz and Ewald (1968). The ecology and other aspects of biology of this crab in Jamaica were reported by Hartnoll (1965b), Warner (1969), and Standing (1972).

Sesarma (Holometopus) roberti H. Milne Edwards, 1853 (Ann. Sci. Nat. ser. 3, Zool. 20: 182)

Common Name: Brackish-water Crab

As ***S. angustipes***—Rathbun, 1918, p. 311, pl. 90.
As ***S. roberti***—Rathbun, 1918, p. 312, pl. 91; Rathbun, 1933, p. 91; Monod, 1956, p. 443, figs. 602–604; Chace & Hobbs, 1969, p. 184, figs. 60, 62l–n.

Range: Veracruz, Mexico to Nicaragua; north and south coasts of Cuba; Jamaica; Hispaniola; Puerto Rico; Virgin Islands to Trinidad; Venezuela.

Habitat: streams, rivers, and bays, including a wide range of freshwater and brackish environments; from marine shorelines to upland elevations of 1000 feet; burrows in steep muddy banks; among mangroves; on rocks in streams; among stony areas at bases of cliffs.

Remarks: Monod (1956) questioned the occurrence of *S. roberti* on Goree Island off West Africa, the indicated type-locality for this species. Hartnoll (1965b) reported on the biology of this crab in Jamaica (under the name *S. angustipes*, which he used as a senior synonym of *S. roberti*). Chace & Hobbs (1969) maintained the distinction between these two species, at least until a South American specimen with Caribbean characteristics is discovered. Abele (1972b) reviewed these reports and also regarded the two forms as separate species.

Sesarma (Holometopus) tampicense Rathbun, 1914.

This name was determined by Chace & Hobbs (1969) to be a junior synonym of *S. americanum*.

Subgenus ***Sesarma*** Say, 1817

Sesarma (Sesarma) curacaoense de Man, 1892 (Notes Leyden Mus. 14: 257)

Common Name: Mangrove Crab

Rathbun, 1918, p. 293, text-fig. 147, pl. 78, figs. 1–2, pl. 160, fig. 3; Rathbun, 1933, p. 90; Holthuis, 1959, p. 242; Chace & Hobbs, 1969, p. 188, figs. 61, 62p; Abele, 1973, p. 380, figs. 1C, 1F.

Range: Key West, Florida; south and southwest Florida; north coast of Cuba; Jamaica; Puerto Rico; Curaçao; Bahia, Brazil.

Habitat: muddy banks of rivers and ditches, including brackish water; in mangrove swamps, under rocks and litter; intertidal zone, in clumps of oysters and among rocks.

Remarks: Abele (1973) commented on sexual maturity and size ranges, but he did not report ovigerous females in the Florida material he studied. Tabb and Manning (1961) listed this crab from mangroves at Whitewater Bay in south Florida. Ecology of this species in Jamaica was studied by Hartnoll (1965b) and Warner (1969). Listed from Brazil by Coelho and Ramos (1972).

Sesarma (Sesarma) reticulatum (Say, 1817) (J. Acad. Nat. Sci. Philadelphia 1: 73)

Common Name: Marsh Crab

As ***S. reticulata***—Hay & Shore, 1918, p. 448, pl. 36, fig. 12.
As ***S. reticulatum***—Rathbun, 1918, p. 290, pl. 77; Williams, 1965, p. 221, fig. 205; Felder, 1973a, p. 78, pl. 11, fig. 7; Abele, 1973, p. 380, fig. 1D, 1E.

Range: Massachusetts to east coast of Florida; west coast of Florida to central Texas.

Habitat: *Spartina* salt marshes; burrows in soft muds and sand-mud; under rocks and litter of intertidal streams and near-marine to brackish waters.

Remarks: Larval descriptions were provided by O. W. Hyman (1924) and Costlow and Bookhout (1962). Sandifer (1973) reported on larval ecology in Virginia. Crichton (1960) gave a general account of life history as noted in Delaware marshes. Regional lists include Florida (Wass, 1955; Menzel, 1971; Subrahmanyam *et al.*, 1976), Louisiana (Behre, 1950), and Texas (Hedgpeth, 1953; Leary, 1967). The specimen listed by Tabb and Manning (1961) for this species was determined by Abele (1973) to be *S. curacaoense*. Humes (1941b) described a parasitic copepod in the gill chambers of this crab. Physiological studies include work on gill area (Gray, 1957), oxygen consumption (Teal, 1959), rhythmic activity (Palmer, 1967), antennule chemosensitivity (Hazlett, 1971), and melanophore hormones (Fingerman, Nagabhushanam and Philpott, 1961).

Subfamily VARUNINAE H. Milne Edwards, 1852

Euchirograpsus H. Milne Edwards, 1853

Euchirograpsus americanus A. Milne Edwards, 1880 (Bull. Mus. Comp. Zool. 8: 18)

Hay & Shore, 1918, p. 448, pl. 36, fig. 7; Rathbun, 1918, p. 282, text-fig. 144, pl.

74; Chace, 1940, p. 52; Williams, 1965, p. 220, fig. 204; Türkay, 1975, p. 114, figs. 6–7, 16b, 20, 24.

Range: North and South Carolina; south Florida; north and south coasts of Cuba; St. Lucia; Barbados; Colombia to Venezuela.

Depth: 31 to 508 m (17 to 278 fm).

Habitat: rocky, coral, and sand substrates.

Remarks: Listed from off the Carolinas by Cerame-Vivas, Williams and Gray (1963) and Cerame-Vivas and Gray (1966). Williams (1965) listed ovigerous females from Florida in March to September. Recorded off the Atlantic coast of Cuba by Chace (1956). The Pacific specimens listed by Garth (1946) were referred to a new species, *E. pacificus*, and the specimen (USNM 17672) listed by Rathbun (1918) from off Yucatan was referred to a new species, *E. antillensis*, by Türkay (1975).

Euchirograpsus antillensis Türkay, 1975 (Senckenbergiana Biol. 56: 112)

As ***E. americanus***—Rathbun, 1918, p. 283 (part, Yucatan specimen only).
As ***E. antillensis***—Türkay, 1975, p. 112, figs. 4–5, 16a, 19, 25.

Range: off Havana, Cuba; Arrowsmith Banks, between Cuba and Yucatan; south of Florida Keys; Bahamas.

Depth: 192 to 430 m (105 to 235 fm).

Remarks: Türkay (1975) compared this new species with *E. americanus* and the other species of the genus, which now number a total of six.

Platychirograpsus de Man, 1896

Platychirograpsus spectabilis de Man, 1896 (Zool. Anz. 19: 292)

Common Names: River Crab; Saber Crab

As ***P. typicus***—Rathbun, 1918, p. 278, text-figs. 141–143, pl. 73; Bolívar y Pieltain, 1945, p. 267–270, figs. 1–5.
As ***P. spectabilis***—Buitendijk, 1950, p. 280, fig. 1b; Monod, 1956, p. 426, text-figs. 584–588.

Range: Gulf coast of Mexico; west coast of Florida.

Habitat: burrows in clay banks, just above the water line, along rivers; shallow rocky areas of rivers; known from altitudes of greater than 100 feet, up to 140 miles from the sea.

Remarks: This species was described on the basis of only a few specimens, all from Tabasco, Mexico. Marchand (1946) discovered a large population of these crabs along the Hillsborough River in west Florida, which empties into the Gulf near Tampa. These crabs were found to have originated in Mexico from where they were transported on logs and in lumber for Tampa, beginning about 1915. Marchand (1946) provided notes on ecology, behavior, and feeding habits of the west Florida populations, under the name *P. typicus*. Buitendijk (1950) determined this latter name to be a junior synonym of *P. spectabilis*.

Platychirograpsus typicus Rathbun, 1914.

Determined by Buitendijk (1950) to be a junior synonym of *P. spectabilis* de Man, 1896.

Family GECARCINIDAE Macleay, 1838

Cardisoma Latreille, 1825

Cardiosoma guanhumi Latreille, 1825 (Encycl. Méth., Hist. Nat., Entom., vol. 10, p. 685)

Common Names: Great Land Crab; White Land Crab; Mulatto Land Crab; Juey; Tourlourou; Guanhumi; Guaiamu

Rathbun, 1918, p. 341, text-fig. 155, pls. 106–107; Rathbun, 1933, p. 94, fig. 89; Bright, 1966, p. 191, fig. 4–I; Forest & Guinot, 1966, p. 94; Chace & Hobbs, 1969, p. 195, figs. 64, 67a–c; Türkay, 1970, p. 345; Bright & Hogue, 1972; p. 16; Felder, 1973a, p. 79, pl. 12, figs. 1, 4.

Range: Bermuda; Bahamas; southeast Florida; Florida Keys; Louisiana and south Texas; eastern Mexico to Colombia; north and south coasts of Cuba; Jamaica; Puerto Rico; St. Thomas, Virgin Islands to Barbados; Trinidad; Netherlands Antilles; Colombia to São Paulo, Brazil.

Habitat: low-lying coastal areas, especially mangrove swamps; open fields; along rivers, streams, drainage canals and ditches; under buildings; saline soils with high water tables; primarily nocturnal, but diurnal in heavily shaded areas and on days when the sky is heavily overcast.

Remarks: This is the largest land crab in the Gulf of Mexico region. It is commercially harvested as a food item on some islands of the West Indies, especially Puerto Rico. In other areas, such as southern Florida, this crab is considered an agricultural pest because of the damage caused to fields by the large, extensive burrows and also due to the fondness of the crabs for young, growing shoots.

Regional lists include Louisiana (Behre, 1949, 1950) and Texas (Leary, 1967; Felder, 1973a). Listed from Cuba by Chace (1940) and from Brazil by Coelho and Ramos (1972). Accounts of natural history were provided by Gifford (1962b), Feliciano (1962), and Fotheringham and Brunenmeister (1975). Henning (1975a, 1975b) studied the biology of this crab in northern Columbia, including extensive observations on behavior and ecology. Wright (1968) described agonistic behavior, especially chela displays during social encounters. Herreid (1963) investigated feeding behavior and Herreid and Gifford (1963) reported on the burrow as a habitat and on ionic regulation by the crab.

Developmental stages were described by Moreira (1913) and Costlow and Bookhout (1968b). Costlow and Bookhout (1968c) studied the effects of various environmental factors on development. Physiological studies include work on calcium metablism (Gifford and Johnson, 1962), growth and morphometrics (Herreid, 1967), various terrestrial adaptations (Bliss, 1963, 1968), aerial respiration (Cameron, 1975), respiratory pigments (Redmond, 1962), and uric acid metabolism (Gifford, 1968), osmoregulation by larval stages (Kalber and Costlow, 1968), neurobiology of autotomy and leg elevation (Moffett, 1975), pericardial organ neurosecretion (Cooke and Goldstone, 1970; Berlind and Cooke, 1970; Berlind, Cooke and Goldstone, 1970) neural control of walking (Barnes, Spirito and Evoy, 1972; Spirito, Evoy and Barnes, 1972; Evoy and Fourtner,

1973; Fourtner and Evoy, 1973; Moffett, 1975) and biochemistry (Quinn and Lane, 1966, 1967).

Studies of economic and commercial impact include those of de Oliviera (1946) on the fishery and ecology of this crab in Brazil and Feliciano (1962) on the fishery in Puerto Rico. Humes (1958) described a copepod from the gill chambers of this crab.

Gecarcinus Leach, 1814

Gecarcinus lateralis (Freminville, 1835) (Ann. Sci. Nat., ser. 2, Zool. 3: 224)

Common Names: Black Land Crab; Common Land Crab

Rathbun, 1918, p. 355, text-fig. 161, pls. 119–120; Rathbun, 1933, p. 95, fig. 91; Chace & Holthuis, 1948, p. 26; Chace & Hobbs, 1969, p. 198, figs. 65, 67e–g; Türkay, 1970, p. 337, figs. 2a–c; Bright & Hogue, 1972, p. 21; Felder, 1973a, p. 82, pl. 12, figs. 2–3; Türkay, 1973, p. 974, fig. 2.

Range: Bermuda; Bahamas; southeast Florida; Florida Keys; south Texas to north coast of Yucatan; north and south coasts of Cuba; Jamaica; Hispaniola; Puerto Rico; St. Thomas, Virgin Islands to Barbados; Netherlands Antilles; Honduras to Costa Rica; Caribbean coast of Columbia to Surinam.

Habitat: burrows in dry, sandy areas; in back dunes and on dune ridges; up to 1000 foot elevation in Dominica (Chace and Hobbs, 1969); in wooded areas of dune ridges and back dunes of eastern Florida, under logs and leaf litter; primarily nocturnal, but diel in heavily wooded habitats.

Remarks: The status of this species and of *G. quadratus* have been unclear for some time. Türkay (1970) listed *G. quadratus* as a subspecies of *G. lateralis*, but an examination of types in the Paris Museum led Türkay (1973) to conclude that the two are synonymous. Most other workers have listed them as distinct and separate species, yet recognizing the complex distribution pattern of *G. quadratus* on both sides of Central America. Some specimens of *G. lateralis* have also been reported from the Pacific coast. Specimens collected in Texas (Ray, 1967; Britton, 1976; personal collections) are of *G. lateralis*.

Regional lists include Texas (Ray, 1967; Britton, 1976; Felder, 1973a; Fotheringham and Brunenmeister, 1975) and Mexico (Cabrera, 1965, zoea only). Listed from Costa Rica by Bright (1966). Reports on ecology and natural history of this species include Bliss and Sprague (1958b), Weitzman (1963), Bliss (1968), Chace and Hobbs (1969), and Klaassen (1975). This crab has been used for a variety of physiological studies, especially for research on molting and regeneration (Hodge, 1956a, 1956b; Bliss, 1960a, 1960b, 1966; Bliss and Boyer, 1964; Bliss *et al.*, 1972; Skinner, 1965, 1966; Skinner and Graham, 1972; Mason, 1970; Holland and Skinner, 1976; Yamaoka and Skinner, 1976). Other physiological reports include work on osmoregulation and water balance (Bliss, 1963; Bliss, Wang and Martinez, 1966; Mantel, 1968; Copeland, 1968), aerial respiration (Cameron, 1975), lipid metabolism (O'Connor and Gilbert, 1968), coagulation (Morrison and Morrison, 1952; Stutman and Dolliver, 1968), neuroendocrinology (Hodge and Chapman, 1958; Bliss and Sprague, 1958a; Maynard, 1961a, 1961b; Maynard and Maynard, 1962; Weitzman, 1969; Mantel *et al.*, 1975),

oxygen transport in hemolymph (Redmond, 1968), saline composition for lab experiments (Skinner, Marsh and Cook, 1965), neural fine structure (Skobe and Nunnemacher, 1970), and sensitivity to substrate vibrations (Klaassen, 1973).

Gecarcinus quadratus Saussure, 1853 (Rev. Mag. Zool., ser. 2, vol. 5, p. 360)

Common Names: Red Land Crab; Whitespot Crab

Rathbun, 1918, p. 358, text-fig. 162, pls. 121–122; Garth, 1948, p. 58; Bright, 1966, p. 190, fig. 4G; Türkay, 1970, p. 338, fig. 4; Bright & Hogue, 1972, p. 20; Türkay, 1973, p. 974.

Range: Veracruz, Mexico to Turbo, Columbia (Carib.); St. Croix; Jamaica; Barbados; in eastern Pacific, from Acapulco, Mexico to La Libertad, Ecuador.

Habitat: well above the high tide mark of sandy beaches; mangrove and other heavily-vegetated areas of marine shores; under debris and other litter.

Remarks: As indicated for *G. lateralis*, this species may be regarded as distinct, as a subspecies of *G. lateralis*, or as completely synonymous with the latter. Türkay (1970) published a biogeographical distribution map of the two forms which shows considerable overlap in the ranges of the two species. The two forms are listed here as separate species, but those workers accepting Türkay's (1973) synonymy of the two forms can combine the references and locality records.

Gecarcinus ruricola (Linnaeus, 1758) (Syst. Nat., ed. 10, vol. 1, p. 626)

Common names: Black Crab; Mountain Crab; Blue Land Crab; Red Tourlourou

Rathbun, 1918, p. 352, text-fig. 160, pls. 117–118; Chace & Holthuis, 1948, p. 26; Chace & Hobbs, 1969, p. 200, figs. 66, 67h–j; Türkay, 1970, p. 336, fig. 1a–f; Bright & Hogue, 1972, p. 20.

Range: Bahamas; southeast Florida; north and south coasts of Cuba; Cayman Islands; Jamaica; Navassa Island (Carib.); Hispaniola; Puerto Rico; St. Croix to Barbados; Curaçao; Old Providence and Swan Islands (Carib.).

Habitat: closer to the intertidal zone than other species of this genus; on low and marshy ground and on lower slopes of island mountains, up to elevations of 500 m; in wooded dune areas of southeast Florida (rare, personal observation).

Remarks: Descriptions of ecology and behavior are found in Rathbun (1918) and Chace and Hobbs (1969); a summary is provided by Bright and Hogue (1972). Listed from the south coast of Cuba by Chace (1940). This species occurs among dense populations of *G. lateralis* in southeast Florida, but is rather rare.

Superfamily OCYPODOIDEA Rafinesque, 1815

Family OCYPODIDAE Rafinesque, 1815

Subfamily OCYPODINAE Rafinesque, 1815

Ocypode Weber, 1795

Ocypode albicans Bosc, 1801–1802.

Junior synonym for *Ocypode quadrata*, used by Rathbun (1918) and others prior to revision by Holthuis (1959).

Ocypoda arenaria Say, 1817.

Junior synonym and invalid generic name for *Ocypode quadrata*, used by Cowles (1908) and some other early studies.

Ocypode quadrata (Fabricius, 1787) (Mantissa insect . . ., vol. 1, p. 315)

Common Names: Ghost Crab; Sand Crab; Racing Crab

> As ***O. albicans***—Rathbun, 1918, p. 367, pls. 127–128; Rathbun, 1933, p. 96, fig. 92.
> As ***O. quadrata***—Holthuis, 1959, p. 259; Williams, 1965, p. 225, fig. 208; Chace & Hobbs, 1969, p. 204, figs. 68–69; Felder, 1973a, p. 82, pl. 12, figs. 5, 8.

Range: Bermuda; Bahamas; Rhode Island to south Florida; Florida Keys and Dry Tortugas; west coast of Florida, around entire Gulf coast to Yucatan; north and south coasts of Cuba, through West Indies to Barbados; from Yucatan, along east coast of Central America and the north coast of South America to Estado de Santa Catarina, Brazil; most Caribbean Islands, including Netherlands Antilles, Old Providence Island, etc. Megalops have been collected as far north as Massachusetts.

Habitat: on sandy beaches, from high water line to back dunes areas; younger crabs burrow closer to water line and among beach vegetation; along wave-exposed shores, protected harbor beaches, bays, intracoastal canals, and lagoons; juveniles are mainly diel and older adults are primarily nocturnal, depending on degree of disturbance by man and various environmental factors. Adults usually burrow well back from the waterline, but often feed at the driftline.

Remarks: Regional lists include Florida (Wass, 1955; Menzel, 1971), Mississippi (Richmond, 1962), Louisiana (Behre, 1950; Hoese and Valentine, 1972), and Texas (Whitten, Rosene and Hedgpeth, 1950; Hedgpeth, 1953; Leary, 1967; Fotheringham and Brunenmeister, 1975). Bright and Hogue (1972) include this species in their world-list of land crabs; listed from Brazil by Coelho (1971a), Coelho and Ramos (1972), and Fausto Filho (1974).

Diaz and Costlow (1972) described and illustrated larval stages raised under laboratory conditions. Haley (1969) provided data on growth and morphometrics of Texas populations; reproductive cycling, female morphometrics, and population dynamics were covered in Haley (1967, 1972). Hughes (1973) described mating behavior in the laboratory and compared the mating functions of burrows in several ghost crab species. Population densities and interactions with man were studied by Teerling (1970). Accounts of general natural history were provided by Cowles (1908) for populations in the Tortugas (as *Ocypoda arenaria*) and by Milne and Milne (1946) for New Jersey. Williams (1965) summarized many of the recent studies. Chace and Hobbs (1969) described color phases of Dominican populations. Burrow construction and ecology in Texas was reported by Hill and Hunter (1973) and predatory behavior on mole crabs was noted by Fales (1976). Schone (1968) investigated agonistic displays and these were also presented in a film (Schone and Eibl-Eibesfeldt, 1965).

Physiological studies include work on oxygen consumption (Pearse, 1929; Ayres, 1938; Vernberg, 1956; Gray, 1957), water relations and the role of the pericardial sac (Blass, 1963, 1968), ionic regulation and respiration (Flemister

and Flemister, 1951; Flemister, 1958), ionic and osmotic regulation (Gifford, 1962a), gill and "kidney" histophysiology (Flemister, 1959), biochemistry of terrestrial adaptations (Vernberg and Vernberg, 1968), thoracic neurosecretion (Maynard, 1961a, 1961b; Maynard and Maynard, 1962), and visual perception (Schone and Schone, 1961). Studies of acoustic perception and related behavior include Horch and Salmon (1969), Horch (1971), and Salmon and Horch (1972).

Uca Leach, 1814

(This genus of intertidal ocypodids, along with a few other Australo-Asian genera, are commonly known as fiddler crabs. A number of subgenera have been proposed for this large and diverse genus. Bott (1973) split this genus into 10 genera and Crane (1975) also created a number of subgenera. Although Crane's (1975) monograph is a comprehensive and monumental work, taxonomic precedence must be given to Bott (1973) with regard to most of these proposed changes. For the present, and in agreement with a review by von Hagen (1976), this compilation will avoid the use of subgenera and will continue the use of *Uca*, with the species arranged alphabetically.)

Uca burgersi Holthuis, 1967 (Zool. Meded. Leiden 42: 52)

As ***U. mordax***—Rathbun, 1918, p. 391 (part), not text-fig. 166, nor pl. 134, figs. 3–4; Maccagno, 1928, p. 46 (part); de Oliviera, 1939a, p. 138; Holthuis, 1959, p. 265.

As ***U. burgersi***—Holthuis, 1967, p. 52; Chace & Hobbs, 1969, p. 207, figs. 70, 71a–d; Gibbs, 1974, p. 84; Crane, 1975, p. 168, figs. 26F, 31H, 54G, 66F, 100, pl. 24E–H, map 12.

Range: Bahamas; east coast of Florida; northeast (Gulf) coast of Yucatan; north and south coasts of Cuba; Jamaica; Hispaniola; Puerto Rico; St. Thomas, Virgin Islands to Trinidad; Curaçao; east coast of Yucatan to Guatamala; Caribbean coast of Panama; Venezuela to Rio de Janeiro, Brazil.

Habitat: sheltered mud flats; sloping mud banks and mud-sand areas at mouths of streams; along shores of lagoons and estuaries; often near mangroves; intertidal; above high tide mark in mangrove thickets of Florida, associated with *U. rapax*.

Remarks: Earlier references confused this species with *U. mordax*, to which it is similar in morphology, ecology, and geographical range. This species was also recorded as *U. affinis* by Holthuis (1959), when he distinguished it from *U. mordax* in Surinam. Records of this crab from west Africa are questioned by Crane (1975). Crane (1957) included data on waving displays as part of her description of *U. mordax*. Adaptation to intertidal zone habitats was reported by von Hagen (1970b) and Salmon (1967) obtained sound recordings of leg-wagging (as *U. mordax*). Gibbs (1974) investigated the ecology of this crab on Barbuda and Gibbs and Bryan (1972) studied cation composition of the exoskeleton.

Uca leptodactyla Rathbun, 1898 (Ann. New York, Acad. Sci. 11: 227)

Rathbun, 1918, p. 420, pl. 156; Maccagno, 1928, p. 41 (part), not text-fig. 25; Rathbun, 1933, p. 98; de Oliviera, 1939a, p. 126, pl. 5, text-figs. 25–28, pl. 6, fig. 29, pl. 8, fig. 47, pl. 13, figs. 61–62; Chace & Hobbs, 1969, p. 212, figs, 71g–h; von Hagen, 1970a, p. 227; Crane, 1975, p. 304, text-figs. 37M, 56F, 60N–O, 69K–L, 101, map 17, pl. 41A–D.

Range: Bahamas; west coast of Florida (not recently); east coast of Yucatan; north coast of Cuba; Jamaica; Puerto Rico; St. Croix; Curaçao; Venezuela to Santa Catarina, Brazil.

Habitat: relatively sandy tidal flats of marine waters; sometimes at supratidal levels, where burrows are covered only by spring tides; occasionally in mud or clay substrates, in partial shade of mangrove trees.

Remarks: Behavioral studies include Matthews (1930), Crane (1957), and Gerlach (1958b). Ecological data were provided by Matthews (1930), de Oliviera (1939a, 1939b, 1939c), and Crane (1957). Bott (1973) lists this species under his genus *Leptuca*; Crane (1975) lists it under her subgenus *Celuca*. Listed from Brazil by Coelho (1971a) and Coelho and Ramos (1972).

Uca longisignalis Salmon & Atsaides, 1968 (Proc. Biol. Soc. Washington 81: 279)

As ***U. pugnax rapax***—Rathbun, 1918, p. 397 (part), not. pl. 140.
As ***U. longisignalis***—Salmon & Atsaides, 1968b, p. 279, text-figs. 1–4, 6, 7.
As ***U. rapax longisignalis***—Crane, 1975, p. 190, map 14.

Range: northwest Florida to south Texas.

Habitat: similar to that of *U. rapax*; often on exposed salt flats and algal beds; among marsh vegetation; substrates of mud, mud-sand, and sand-mud.

Remarks: Felder (1973a) comments on the distribution of *U. pugnax*, *U. virens* and *U. longisignalis* and retains the name of *U. pugnax* for all forms in the northwestern Gulf. Crane (1975) listed this form as a subspecies of *U. rapax*, which until recently was a subspecies of *U. pugnax*. In a review of Crane's (1975) monograph, von Hagen (1976) commented that an examination of Salmon's holotypes left "no doubt that *U. rapax longisignalis* is a synonym of *U. minax* (Le Conte)." The present list treats this crab as a separate species, mainly on the basis of Salmon and Atsaides (1968b) evidence of behavioral separation and on the lack of agreement among other authorities as to which subspecies or species it is most closely allied with. Subrahmanyam *et al.* (1976) listed this crab from northwest Florida and Powers (1975) noted its occurrence in Texas. Included in the key to northwestern Gulf *Uca* by Fotheringham and Brunenmeister (1975). Abele (1970) provided habitat notes on populations at Alligator Harbor, Florida.

Uca minax (Le Conte, 1855) (Proc. Acad. Nat. Sci. Philadelphia 7: 403)

Common Names: Red-Jointed Fiddler Crab; Brackish Water Fiddle Crab

Hay & Shore, 1918, p. 451, pl. 37, fig. 3; Rathbun, 1918, p. 389, pl. 137; Maccagno, 1928, p. 48, text-fig. 31; Crane, 1943a, p. 220, text-fig. 1b; Williams, 1965, p. 227, figs. 209A, 210B; Felder, 1973a, p. 85, pl. 12, fig. 12; Crane, 1975, p. 176, figs. 67D, 81K, 100, pl. 25E–H, map 12.

Range: Massachusetts to northeast Florida; northwest Florida to Louisiana, possibly Texas.

Habitat: brackish to fresh waters of estuaries, bays and streams; drainage ditches and canals; usually located some distance from marine waters, but often subject to some tidal influence, particularly along the Atlantic coast; burrows in mud banks and among marsh vegetation, often supratidal; occasionally at edges of fields or woodlands.

Remarks: Crane (1975) questioned the presence of this species from Texas, stating that records listed by Rathbun (1918) from Texas were found to be *U. rapax longisignalis* and *U. pugnax virens*; von Hagen (1976) believes that *U.* (*rapax*) *longisignalis* is a synonym of *U. minas*. If the latter is true, then the range of *U. minax* would definitely include Texas, but the form described by Salmon and Atsaides (1968b) as *U. longisignalis* does not inhabit freshwater and brackish areas. Listed from northwest Florida by Wass (1955), Abele (1970), and Menzel (1971), from Louisiana by Behre (1950) and Felder (1973a), and from Texas by Leary (1967), but the latter is probably based on Rathbun (1918).

Gray (1942) and Miller (1965) provided descriptions of natural history and Williams (1965) summarized much of the current literature. Hyman (1920, 1922) described post-larval development and behavior, including spawning. Ecological studies include Teal (1958) in Georgia, Miller and Maurer (1973) on distribution in relation to salinity, Whiting (1972) and Whiting and Moshiri (1974) on distribution in relation to substrate, and Kerwin (1971) on distribution in relation to marsh vegetation. Salmon (1967) studied distribution in Florida. Miller (1961) compared feeding adaptations in this and other *Uca* species. Physiological studies include work on gill area (Gray, 1957), osmotic and ionic regulation (Cole, 1971), the relationship between respiration and habitat (Teal, 1959), tolerance to desiccation (Pearse, 1929), acclimation to temperature (Vernberg, 1959), tidal rhythms of color change (Fingerman, Lowe and Mobberly, 1958), and radiation sensitivity (Engel, 1973). Nimmo *et al.* (1971) studied PCB absorbtion from sediments. Behavioral studies include descriptions of waving displays (Crane, 1943a, 1957; Salmon, 1965), sound production (Salmon, 1965), and vibration reception (Salmon and Horch, 1973).

Uca mordax (Smith, 1870).

Although recorded from the Gulf of Mexico by Rathbun (1918, p. 391), these and earlier records had confused this species with *U. vocator*, *U. rapax*, and *U. burgersi*. Crane (1975, p. 173) restricts *U. mordax* to the continental coast, from Guatamala to Brazil, plus the island of Trinidad.

Uca panacea Novak & Salmon, 1974 (Proc. Biol. Soc. Washington 87: 313)

Common Name: Sand Fiddler Crab

As ***U. pugilator***—Rathbun, 1918, p. 400 (part), not pl. 141 and pl. 169, fig. 2; Felder, 1973a, p. 83; Crane, 1975, p. 223 (part), not pl. 29E–H, part map 16, other figs. indet.

As ***U. panacea***—Novak & Salmon, 1974, p. 316, figs. 1–8.

Range: northwest Florida to south Texas.

Habitat: sandy areas of marshes and tidal flats; often supratidal, intertidal in some areas; well inland on Texas barrier islands; similar to habitats of *U. pugilator* when intertidal.

Remarks: This species is morphologically similar to *U. pugilator*, but it has been separated from the latter on the basis of biochemical (Selander, Johnson and Avise, 1971) and behavioral studies (Novak and Salmon, 1974). Color variants of "*U. pugilator*" from Florida were noted by Rao & Fingerman (1968), a species-specific character present only in living specimens. It is likely that many of the studies reported as "*U. pugilator*," when collected from the central and western Gulf coasts, actually utilized *U. panacea*. *Uca pugilator* has been collected as far west as central Texas (Carl Thurman, pers. comm.; pers. observ. of author), indicating greater geographical overlap between the two species than reported by Novak and Salmon (1974). Other authors (Felder, 1973a; Crane, 1975) regarded the two forms as one species. The southern limits of *U. panacea* have not been defined yet, but may extend into northeastern Mexico. Hedgpeth (1950) commented on the ecology of this crab on salt flats in Texas and Powers (1973) provided data on burrow densities. Ecological and behavioral data on Texas barrier island populations were presented by Powers (1975) and Powers and Cole (1976). Studies prior to 1974, using the name *U. pugilator*, may include either or both species; regional lists and references are listed under *U. pugilator*, but many of these studies are undoubtably of *U. panacea*.

Uca pugilator (Bosc, 1802) (Hist. Nat. Crust., vol. 1, an X, p. 197)

Common Name: Sand Fiddler Crab

Hay & Shore, 1918, p. 452, pl. 37, fig. 2; Rathbun, 1918, p. 400 (part), pl. 141, pl. 160, fig. 2; Maccagno, 1928, p. 44, text-fig. 28; Crane, 1943a, p. 220; Williams, 1965, p, 232, figs. 209C, 210C–D, 211; Crane, 1975, p. 223 (part), text-figs. 37K, 69F, 101, pl. 29E–H, map 16 (part).

Range: Bahamas; Massachusetts to south Florida; Florida Keys; west and northwest coasts of Florida; Mississippi to Texas; ? Santo Domingo; ? Old Providence Island (Carib.)

Habitat: sandy and sand-mud substrates; intertidal to supratidal marshes; burrows on open sand flats or among thick clumps of grasses and other vegetation.

Remarks: This species is listed by Bott (1973) in the genus *Planuca* and by Crane (1975) in the subgenus *Celuca*. The status of the Caribbean specimens needs to be re-examined with respect to *U. pugilator* and *U. panacea*. Because of the widespread use of this animal in experimental studies, the taxonomic relationships and variability of morphological, behavioral, and physiological features need to be defined and established for both of these closely-related forms. A partial listing of the large literature on *U. pugilator*, including some of *U. panacea*, follows.

Accounts of natural history include Pease (1914) in Massachusetts, Schwartz and Safir (1915) in New York, and studies by O. W. Hyman (1920, 1922) and Dembowski (1925, 1926). Developmental studies were reported by Hyman

(1920), Gray (1942) on transient prezoea, and by Hernkind (1968b). Miller (1968) investigated asymmetry during growth and Vernberg and Costlow (1966) studied handedness. Ecological studies include work on habitat preferences in Georgia (Teal, 1958), feeding efficiency (Miller, 1961), habitats in the Bahamas (Coventry, 1944), habitats in Massachusetts (Knopf, 1966), distribution in relation to thermal tolerance (Miller and Vernberg, 1968), thermal relations of crab and microhabitat (Smith and Miller, 1973), and capture-recapture methods (Hockett and Kritzler, 1972).

Sand Fiddlers have been the subjects of many behavioral studies: displays and courtships (Pease, 1914; Dembowski, 1925, 1926; Crane, 1943a, 1957), threat displays (Schone, 1968; Aspey, 1971), sound production and visual signals (Burkenroad, 1947; Salmon and Stout, 1962; Salmon, 1965, 1967; Salmon and Atsaides, 1969; Salmon and Horch, 1972), burrowing activity (Teal, 1958; Coward, Gerhardt and Crockett, 1970), visual orientation (Herrnkind, 1968a, 1968c, 1972), feeding (Miller, 1961), locomotion (Baird and Burleson, 1970), and larval shadow responses (Forward, 1977).

Physiological studies include work on molting (Abramowitz and Abramowitz, 1940; Guyselman, 1953; Stewart and Green, 1969; Skinner and Graham, 1972; Fingerman and Fingerman, 1976; Weis, 1976a), regeneration (Weis, 1976b, 1976c, 1977a, 1977b; Weis and Mantel, 1976), color changes and chromatophores (Carlson, 1935, 1936; Brown and Sandeen, 1948; Brown and Webb, 1948; Brown, 1950; Guyselman, 1953; Webb, Bennett and Brown, 1954; Fingerman and Yamamoto, 1967; Barnwell, 1968a; Rao and Fingerman, 1968; Fingerman, Rao and Ring, 1969; Coohill and Fingerman, 1975), metabolism (W. B. Vernberg and Vernberg, 1972), rhythmical activity and physiology (Brown *et al.*, 1955; Fingerman, 1956, 1957; Fingerman, Lowe and Mobberly, 1958; Barnwell, 1966, 1968b), biochemistry (Eisen *et al.*, 1973), sensitivity to anemone toxin (Blanquet, 1968), reproduction and endocrinology (Darby, 1935; Brown and Jones, 1949; Sandeen, 1950; Fingerman and Fitzpatrick, 1956; Fingerman and Couch, 1967; Rao, Fingerman and Bartell, 1967; Rao and Fingerman, 1969, 1970; Fingerman, 1970, 1973; Bartell, Rao and Fingerman, 1971; Fielder, Rao and Fingerman, 1971), thermoregulation and temperature adaptations (Edwards, 1950; Orr, 1955; Demeusy, 1957; Wilkins and Fingerman, 1965; Vernberg, DeCoursey and Padgett, 1973), osmoregulation (Pease, 1929; Teal, 1958; Green *et al.*, 1959; Evans, Cooper and Bogan, 1976), toxicology (Nimmo *et al.*, 1971; DeCoursey and Vernberg, 1972; O'Hara, 1973), respiration (Gray, 1957; Teal, 1959; Wilkins and Fingerman, 1965; Smith and Miller, 1973; Silverthorn, 1975a, 1975b), sensory perception (Salmon and Atsaides, 1969; Horch and Salmon, 1969; Salmon, 1971; Langdon, 1971; Avent, 1974; Hyatt, 1974, 1975; Salmon, Horch and Hyatt, 1977), neurobiology (Nunnemacher, 1965; Andrews, 1973), radiation sensitivity (Engel, 1973), and infection by bacteria (Spindler-Barth, 1976).

Regional lists include Florida (Wass, 1955; Tabb and Manning, 1961; Menzel, 1971), Louisiana (Behre, 1950; Hoese and Valentine, 1972), and Texas (Hedgpeth, 1950, 1953; Whitten, Rosene and Hedgpeth, 1950; Simmons, 1957; Leary, 1967), but the Louisiana and Texas records probably refer to *Uca panacea.*

Uca pugnax (Smith, 1870).

This is another species with a history of frequent nomenclatural changes. Most older references have included this crab as a Gulf species, but Salmon and Atsaides (1968b) referred the Gulf populations of *U. pugnax* to new species, *U. virens* and *U. longisignalis*. Crane (1975) maintained *U. virens* as a subspecies of *U. pugnax*, but she placed *U. longisignalis* as a subspecies of *U. rapax*. Until a revision by Tashian and Vernberg (1958), *U. rapax* was considered a subspecies of *U. pugnax*; thus all four forms are closely related. However, von Hagen (1976) synonymizes *U. virens* with *U. rapax* and considers *U. longisignalis* to be synonymous with *U. minax*! The present list treats each form separately, maintaining each species presented by Salmon and Atsaides (1968b) and excluding *U. pugnax* as a Gulf species.

Uca rapax (Smith, 1870) (Trans. Connecticut Acad. Arts Sci. 2: 134)

> As ***U. pugnax rapax***—Rathbun, 1918, p. 397 (part), pl. 140; Maccagno, 1928, p. 45, text-fig. 29; Rathbun, 1933, p. 97; de Oliviera, 1939a, p. 134.
> As ***U. rapax***—Tashian & Vernberg, 1958, Holthuis, 1959, p. 266, text-figs. 64d–f, 65, pl. 14, figs. 4–6, pl. 15, fig. 3; Chace & Hobbs, 1969, p. 214, figs. 73a–b; von Hagen, 1970a, p. 226; Crane, 1975, p. 190, figs. 52C–DD, 54F, 67C, 86, 91E–F, 100, pls. 27A–D, 45C–F, map 14.

Range: Bahamas; east coast of Florida; Florida Keys; southwest coast of Florida; northeast coast of Mexico to northeast Yucatan; north and south coasts of Cuba; Jamaica; Hispaniola; Puerto Rico; St. Thomas, Virgin Islands to Trinidad and Tobago; Netherlands Antilles; east coast of Yucatan to Guatamala; Caribbean coast of Panama to Santa Catarina, Brazil.

Habitat: mud, sand-mud, and mud-sand flats; edges of mangroves; along rivers and streams on flats and banks.

Remarks: This species may also occur infrequently along the northwestern Gulf coast, but Crane (1975) attributes records of this crab to *U. rapax longisignalis*. Felder (1973a) listed *U. rapax* from the same area, but past records may be erroneous with regard to the several similar species involved. Listed from Brazil by Coelho and Ramos (1972).

Behavioral studies include observations on waving displays (Crane, 1943a, 1957), combat between males (Crane, 1957, 1967), visual and acoustical signalling (Salmon and Atsaides, 1968a), kinaesthetic orientation (von Hagen, 1967), orientation to burrows (von Hagen, 1970b), and feeding (Miller, 1965). Warner (1969) studied the natural history of this crab in Jamaica and Holthuis (1959) provided ecological notes and populations in Surinam. Smith and Miller (1973) measured thermal adaptations. Barnwell (1963) observed motor activity and the rhythmicity of color changes in populations in Brazil. Handedness and its relationship to development was analyzed by Vernberg and Costlow (1966). Adaptations to particular tidal levels were observed by von Hagen (1970b). Salmon (1971) measured vibration receptivity and van Delft (1968) studied daily rhythms of color changes.

Uca speciosa (Ives, 1891) (Proc. Nat. Acad. Sci. Philadelphia 1891: 179)

Rathbun, 1918, p. 408, pl. 145; Chace & Hobbs, 1969, p. 215, figs. 73c–d; von Hagen, 1970a, p. 227; Crane, 1975, p. 236, text-figs. 68G, 101, map 15, pl. 31A–D.

Range: southeast Florida; Florida Keys; west and northwest coasts of Florida; northeast Yucatan and northwest Cuba.

Habitat: wet, muddy substrates; mid to high intertidal zone; commonly found in mangroves.

Remarks: Specimens from Curaçao reported by Rathbun (1918) were referred to *U. cumulanta* by Chace and Hobbs (1969); Crane (1975) referred the Jamaican specimen of Chace and Hobbs (1969) to *U. cumulanta.* Crane (1957) provided some preliminary data on courtship displays and Salmon (1967) analyzed waving patterns of the crabs. Miller (1965) studied the distribution and ecology of this species. Listed from Florida by Wass (1955), Tabb and Manning (1961) and Subrahmanyam *et al.* (1976).

Uca spinicarpa Rathbun, 1900 (Amer. Natural. 34: 586)

As ***U. spinicarpa***—Rathbun, 1918, p. 411, pl. 148; Felder, 1973a, p. 83, pl. 12, fig. 11.

As ***U. speciosa spinicarpa***—Crane, 1975, p. 239, figs. 68K, 101, pl. 31E–H, map 15.

Range: Alabama to northeastern coast of Mexico.

Habitat: muddy banks of coastal freshwater ponds and streams; muddy, brackish beaches of the Gulf; grassy mud flats off bays (after Felder, 1973a).

Remarks: This crab was considered a separate, but allied species to *U. speciosa* by Rathbun (1918) and subsequent workers. Crane (1975) placed it as a subspecies of the latter. Felder (1973a) listed several personal collections in Louisiana and Mississippi. Listed from Texas by Leary (1967) and Fotheringham and Brunenmeister (1975) comment on its presence in the northwestern Gulf, providing a key for comparison with other *Uca* species. Bott (1973) placed this species and *U. speciosa* in his genus *Leptuca*; Crane's (1975) subgenus designation is *Celuca.*

Uca subcylindrica (Stimpson, 1859) (Ann. Lyc. Nat. Hist. New York 7: 63)

Rathbun, 1918, p. 419, pl. 155, pl. 160, fig. 5; Felder, 1973a, p. 83, pl. 12, fig. 10; Crane, 1975, p. 209, figs. 67, 100, pl. E–H, map 11.

Range: Texas to northeastern coast of Mexico.

Habitat: banks of freshwater streams; brackish water areas; on mud flats and algal beds, often some distance upstream from mouths of rivers and creeks.

Remarks: This species is uncommon and has a restricted range. Listed by Fotheringham and Brunenmeister (1975) for the northwestern Gulf. Very little is known about this crab's ecology, behavior, or other biological aspects.

Uca thayeri Rathbun, 1900 (Proc. Washington Acad. Sci. 2: 134)

Rathbun, 1918, p. 406, text-fig. 169, pl. 144; Rathbun, 1933, p. 98; Holthuis, 1959, p. 275, text-figs. 68b–c, pl. 16; Chace & Hobbs, 1969, p. 216, text-figs. 73e–f; von Hagen, 1970a, p. 226; Crane, 1975, p. 112, figs. 46K, 56E, 60H–I, 73A–B, 81I, 82I, 99, map 11, pl. 17.

Range: east and southwest coasts of Florida; north and south coasts of Cuba;

Jamaica; Hispaniola; Puerto Rico; Guadeloupe; Trinidad; Tobago; Guatamala and Panama (Caribbean coasts) Venezuela to São Paulo, Brazil.

Habitat: deep mud on banks of streams and estuaries, among mangrove swamps; burrows are often shaded by vegetation.

Remarks: Ecological studies include Gerlach (1958a) in Brazil Warner (1969) in Jamaica, and Salmon (1967) in Florida. Crane (1957) described daily behavioral displays and Barnwell (1963) reported on daily and tidal rhythms of activity. Bott (1973) placed this species in his genus *Planuca*; Crane (1975) designated the subgenus *Boboruca*. Listed from Brazil by Coelho and Ramos (1972).

Uca virens Salmon & Atsaides, 1968 (Proc. Biol. Soc. Washington 81: 281)

As ***U. pugnax***—Felder, 1973a, p. 84.
As ***U. virens***—Salmon & Atsaides, 1968b, p. 281, figs. 2–3, 5–7.
As ***U pugnax virens***—Crane, 1975, p. 203, map 10.
As ***U. rapax***—von Hagen, 1976, p. 224.

Range: Mississippi to Coatzacoalcos (central Gulf coast), Mexico.

Habitat: muddy sand, sand-mud, and mud substrates of salt marshes; algal flats, close to bays, estuaries and inlets; often among marsh vegetation.

Remarks: Studies that have recorded "*Uca pugnax*" from the Gulf coast may represent records of *U. virens* or *U. longisignalis*; the occasional presence of *U. rapax* along the Texas and Mexico coasts is also possible. Salmon and Atsaides (1968b) reported analyses of waving and acoustic signalling. Powers (1975) and Powers and Cole (1976) provided some data on habitats of this crab in Texas. See *Uca pugnax* and *Uca longisignalis* for a discussion of nomenclatural changes in the *pugnax-rapax* species group.

Uca vocator (Herbst, 1804) (Versuch. Natur. Krabben u. Krebse, vol. 1. pl. 59, fig. 1)

As ***U. mordax***—Rathbun, 1918, p. 391 (part), pl. 134, figs. 3–4.
As ***U. murifecenta***—Crane, 1943b, p. 38, text-figs. 1d–f, pl. 1, figs. 1–2.
As ***U. vocator***—Holthuis, 1959, p. 269, text-figs. 66–67, pl. 14, fig. 1, pl. 15, fig. 1; Chace & Hobbs, 1969, p. 217, figs. 73g–j, 74; von Hagen, 1970a, p. 225; Crane, 1975, p. 27, figs. 66D, 100, pl. 23E–G, pl. 24A–D, map 13.

Range: Tampico, Mexico; Belize to Guyana; Puerto Rico; Santo Domingo; Guadeloupe; Dominica; Trinidad and Tobago; Paraiba to Pernambuco, Brazil; ? Santa Catarina, Brazil.

Habitat: grassy marshes; mud flats; flat banks of streams and rivers; in damp mud among mangroves.

Remarks: This species was presented by Rathbun (1918) with *U. mordax*. Ecological data includes studies by Crane (1943b) in Venezuela, by Holthuis (1959) in Surinam, by Chace and Hobbs (1969) in Dominica, and by von Hagen (1970a, 1970c), who also commented on sound production and other aspects of behavior. The only record for this species from the Gulf of Mexico is that listed by Crane (1975) for Tampico, Mexico. Listed from Brazil by Coelho and Ramos (1972) for Paraiba and Pernambuco, but Crane (1975) questions the record from Santa Catarina.

Ucides Rathbun, 1897

Ucides cordatus (Linnaeus, 1763) (Amoen. Acad., vol. 6, p. 414)

Common Names: Pagurus; Kaburi

Rathbun, 1918, p. 347, text-fig. 158, pls. 110–113, pl. 159, figs. 3–4; Rathbun, 1933, p. 95, fig. 90; Bott, 1955, p. 66; Bright, 1966, p. 191; Chace & Hobbs, 1969, p. 219, figs. 75–76; Türkay, 1970, p. 351, fig. 10a–d; Bright & Hogue, 1972, p. 14.

Range: Bahamas; southeast Florida; northeast Mexico to Panama; north and south coasts of Cuba; Jamaica; Hispaniola; Puerto Rico; St. Thomas, Virgin Islands to Grenada; Colombia to Santa Catarina, Brazil.

Habitat: swampy ground, among mangrove roots; in areas of standing brackish water; on mud flats, among *Uca* and *Cardisoma* burrows.

Remarks: Chace and Hobbs (1969) transferred this genus to the Ocypodidae from the Gecarcinidae and Türkay (1970) accepted this transfer. Although the genus did not fit conveniently into any of the existing subfamilies, Chace and Hobbs (1969) felt that it was more closely allied with the Ocypodinae than with others. Türkay (1970) placed the Pacific species, *U. occidentalis*, under *U. cordatus* as a subspecies. Manning and Provenzano (1961) comment on *Ucides* in Florida. Ecological and behavioral notes were provide by Chace and Hobbs (1969) and Bright and Hogue (1972). Warner (1969) discussed the ecology of this crab in Jamaica and de Oliviera (1946) studied its biology in Brazil. Listed from Brazil by Coelho and Ramos (1972). De Souza and Caland (1968) reported on bacterial infections in this species. Ogawa *et al.* (1973a, 1973b) described commercial processing of this crab for food in Brazil. Alves (1975) studied reproductive biology of Brazilian populations.

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